



RELIEF MAP OF CALIFORNIA.

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U. S. DEPARTMENT OF AGRICULTURE.

WEATHER BUREAU.

Bulletin L.

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# CLIMATOLOGY OF CALIFORNIA.

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Prepared under the direction of WILLIS L MOORE, Chief U. S. Weather Bureau,

BY

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# CONTENTS.

ACKNOWLEDGEMENTS .....	Page.
CONTROLLING FACTORS .....	5
Pressure .....	7
Precipitation, San Francisco .....	7
High and low pressures .....	9
West Pacific storms .....	12
Ocean effect .....	13
Topography .....	15
CLIMATE OF NORTH AND CENTRAL COAST .....	16
Eureka and Northern California .....	25
San Francisco .....	33
Some maximum and minimum temperatures .....	33
Notes from record of G. H. Gibbons, M. D. ....	41
The great rainstorm of 1866 Mr. L. J. Le Conte, C. E. ....	42
Rainfall. Mr. John Pettee .....	46
CLIMATE OF SOUTHERN COAST .....	48
San Luis Obispo .....	59
Santa Barbara .....	59
Los Angeles .....	64
San Diego .....	68
CLIMATOLOGY OF THE GREAT VALLEY .....	81
Red Bluff .....	93
Sacramento .....	93
Fresno .....	97
CLIMATE OF SANTA CLARA VALLEY .....	106
Mount Tamalpais, San Francisco, Lick Observatory, San Jose, Menlo Park, San Mateo .....	111
LOCAL CLIMATOLOGY .....	123
GENERAL PRECIPITATION TABLES .....	167
SNOWFALL .....	215
PRECIPITATION AT HIGH LEVELS .....	224
FROST .....	227
FOG .....	239
THUNDERSTORMS .....	251
EARTHQUAKES .....	259



# ILLUSTRATIONS.

Frontispiece.	Page.
FIG. 1. Rainfall at San Francisco, 1849-1902 .....	10
2. Seasonal rainfall at San Francisco, 1850-1902. Intensity, or amount in inches. (Normal, 23 inches) ..	11
3. Seasonal rainfall at San Francisco, 1850-1902. Frequency, or number of days. (Average, 71 days) ..	11
4. Seasonal rainfall at Eureka, from 1887 to 1901 .....	27
5. Sketch map of Humboldt Bay .....	33
6. Monthly curves of hourly wind velocities .....	47
7. Hourly wind velocities at San Francisco .....	47
8. Mean relative humidity—upper, 5 a. m.; lower, 5 p. m. ....	47
9. Percentage of annual rainfall each month .....	47
From Bulletin D, by Prof. A. J. Henry.	
10. Seasonal rainfall at San Diego, from 1850 to 1901 .....	84
11. Seasonal rainfall at Sacramento, from 1849 to 1901 .....	102
12. Seasonal rainfall at Fresno, from 1882 to 1901 .....	109
13. Wire baskets in citrus grove .....	230
14. Wire baskets hung from limbs of orange trees .....	230
15. Wire baskets in lemon and orange grove .....	231
16. Mr. Priestly Hall's device for smudging .....	232
17. Eight miner's inches of warm water in orange grove at Meacham ranch .....	232
18. Lath screen at ranch of Mr. A. J. Everest, Riverside (view from above) .....	233
19. Lath screen at ranch of Mr. A. J. Everest, Riverside (under view) .....	234
20. Fog service at San Francisco. Corner of large map standing in main corridor of Ferry Building. By means of frequent reports from Point Reyes and Mount Tamalpais the extent and character of fog over Drakes Bay, the roadstead, and the Gate itself are known in the city .....	244
21. Morning fog over valleys. (Pl. I) .....	245
22. Lifted fog. Height above ground about 500 meters. (Pl. I) .....	245
23. Sea fog pouring over Sansalito Hills and through Golden Gate. (Pl. II) .....	245
24. Fog waves. (Pl. II) .....	245
25. Fog lifting. View from United States Weather Bureau, Mount Tamalpais, Cal. (Pl. III) .....	245
26. Helmholtzian fog billow. View from United States Weather Bureau observatory, Mount Tamalpais, Cal. (Pl. IV) .....	245
27. Fog billows. (Pl. V) .....	245
28. Fog billows. (Pl. V) .....	245
29. Fog drifting from sea inland. (Pl. VI) .....	245
30. Fog stratum; clear above and cloudy below. (Pl. VI) .....	245
31. Probable condition at time of the Rio de Janeiro wreck, February 22, 1901 .....	249
PLATES 1 to 9. Pressure, wind, and rainfall during the winter months of January and December, 1899; December, 1901; January and February, 1902 .....	9
PLATES 10 to 12. Track of a disturbance across the Pacific Ocean from the Ladrone Islands to the coast of California from November 20, 1895, to January 14, 1896 .....	15

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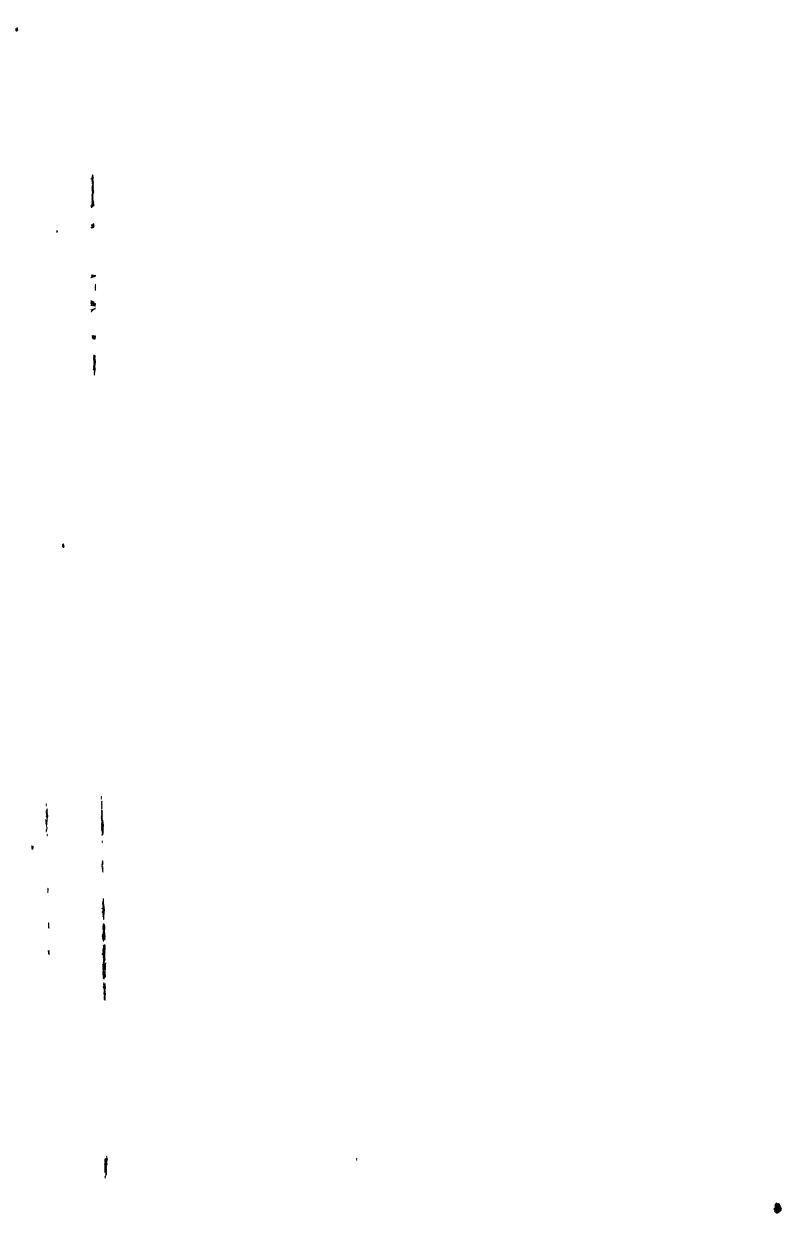
The Southern Pacific Company has for many years had its agents keep a daily record of rainfall and temperature, which records have been compiled by the Weather Bureau office at San Francisco. Data from 181 stations in California have been thus collected. Through the courtesy of the Santa Fe System reports from ten stations in the San Joaquin Valley are received.

Due credit must also be given to the voluntary observers of the State; and in particular to Mr. Samuel H. Gerrish, Sacramento; Mr. J. A. Edman, Edmanton; Mr. J. C. Stanton, Rio Vista; Mr. C. W. Hendel, La Porte; and Dr. C. Max Richter, of Santa Barbara. The records, journals, and diaries of Thomas Tennent, Dr. G. H. Gibbons, Dr. T. A. Logan, and Mr. John Pettee have been generously drawn upon for data. To these records we are indebted for all data preceding the period of regular Weather Bureau observations.

Mr. J. B. Lippincott, of Los Angeles, resident hydrographer of the United States Geological Survey, has kindly placed at our disposal the rainfall data at high altitudes used by him in his engineering practice. In California seasonal rainfalls and data showing probable water supply in various drainage basins are of the utmost importance to the engineering profession. In the present paper many fragmentary rainfall records had to be omitted in order to keep the volume within reasonable limits. Many of these can be found in "Irrigation and Water Storage" by Glassford.

The diagrams of rainfall in this memoir show the seasonal amounts, because for engineering and other purposes the seasonal rather than the calendar year totals are desired. In the various tables, however, it was thought best to continue the usual yearly amounts.

The table of elevations has been materially changed and many corrections made by Prof. George Davidson and Prof. Joseph N. Le Conte, both of the University of California.



# CLIMATOLOGY OF CALIFORNIA.

## CONTROLLING FACTORS.

The general climatic conditions of the Pacific coast, and particularly the climate of California, may be said to be controlled by four great factors. These are

1. The movements of the great continental and oceanic pressure areas—the so-called permanent “highs” and “lows.” Under this head we include also the most active factor in climatic development, namely, the movements of individual pressure areas, since there is now good ground for believing that the paths of these individual disturbances—large-sized whirls and counter whirls—are largely determined by the general relations of the permanent pressure areas;
2. The prevailing drift of the atmosphere in temperate latitudes from west to east;
3. The proximity of the Pacific Ocean with a mean annual temperature near the coast line of about 18° C. (65° F.), a great natural conservator of heat, and to which is chiefly due the moderate range of temperature along the coast from San Diego even to Tatoosh Island; and
4. The exceedingly diversified topography of the country for a distance of 200 miles from the coast inland.

## PRESSURE DISTRIBUTION.

It was early shown by Hoffmeyer that the distribution of the great so-called permanent-pressure areas over the North Atlantic Ocean determined largely the character of the seasons in northern Europe. Teisserenc de Bort, discussing the causes of an abnormal winter in central Europe, called attention to the fact that during this period the great high-pressure area ordinarily overlying the Atlantic Ocean between latitudes 20° and 40° north had moved somewhat from its normal position. Elliot, Blanford, and others have shown that the great atmospheric movements over India are more or less connected with the chief features of the weather there, particularly with respect to the monsoons and rainfalls. Fassig has recently shown that the weather conditions prevailing in the United States east of the Rocky Mountains during March may be connected with the movement of the large pressure areas; and, in brief, that the weather of the Middle Atlantic States “is cold when the continental high controls, warm when the Atlantic high extends its influence westward beyond the coast, and normal when there is a fairly equal development in strength and extent of the two high areas, in which case now one, then the other, is in control of the wind direction, bringing alternately cold and warm air to the region. The paths of storms lie within the trough between the two high areas; when the trough is wide the storm paths are widely scattered; as the high areas approach one another the storm paths are contracted within narrower limits.”

Over the North Pacific Ocean in winter there exists an area of low barometer covering the region between the latitudes of 40° and 60° north and 130° west to 140° east longitude. An area of high pressure overlies the greater part of North America with a southwest extension to the Tropics and west to the one hundred and sixtieth meridian. We shall find that typical wet winters on the California coast occur when this great North Pacific low extends well eastward overlying the continent west of a line drawn from San Francisco to Calgary. At the same time the great continental high area apparently recedes to the southeast. On the other hand, the

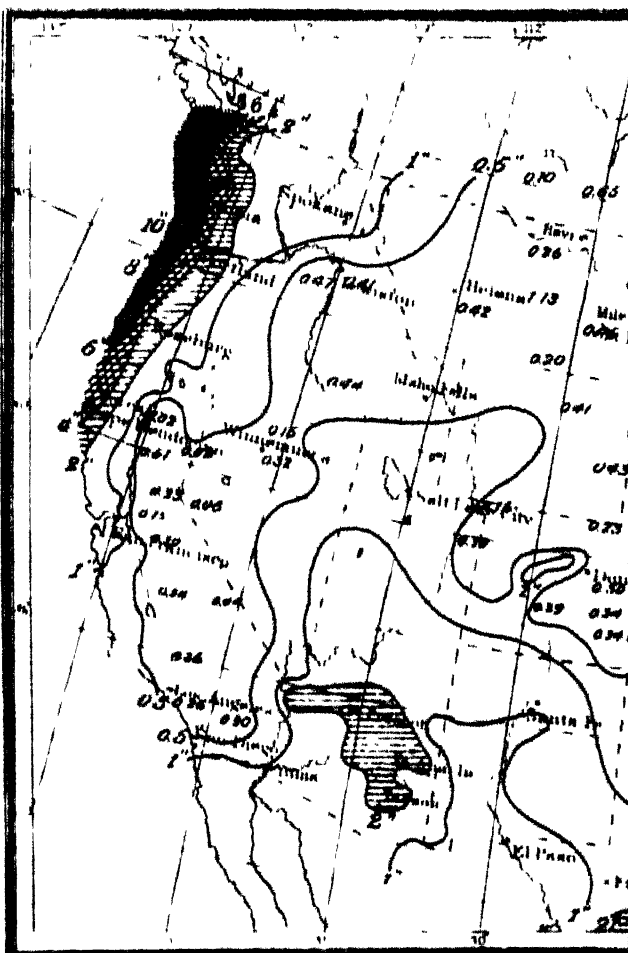
pressure distribution characteristic of a dry winter on the California coast is marked by the prevalence of the continental high over the entire country west of the Rocky Mountains. This relation is very clearly shown in the series of four charts following taken from Prof. A. J. Henry's "Rainfall of the United States." Professor Henry states "The prevailing winds and the pressure distribution shown on the chart for December, 1880, are favorable for heavy precipitation in California and the plateau region. The pressure distribution is abnormal, as is also the rainfall; \* \* \* the chart represents an extreme condition, viz, a transfer of the usual track of low pressure areas of the northern boundary southward to central California and the plateau region of Nevada and Arizona, \* \* \* this region being ordinarily covered by an area of high pressure."

This relation of permanent pressure distribution and rainfall is more plainly shown on the series of charts for December, 1901, January and February, 1902. December and January were months of marked deficiency in rainfall, and it will be noted that during this period the continental "high" overspread nearly the entire country west of the Rocky Mountains. The prevailing air movement in California under such conditions is from the north or northeast and, as might naturally be inferred, such a circulation is accompanied by scanty precipitation. During February, however, there is a noticeable change in pressure distribution. The continental "high" is now well to the east of the Rocky Mountains, while the North Pacific "low" has apparently moved well in over Vancouver Island and Washington. The general air movement is now from the south and southwest and the rainfall very heavy, especially in the northern coast counties of California. At some places in the redwood section the rainfall amounted to as much as 40 inches during the month.

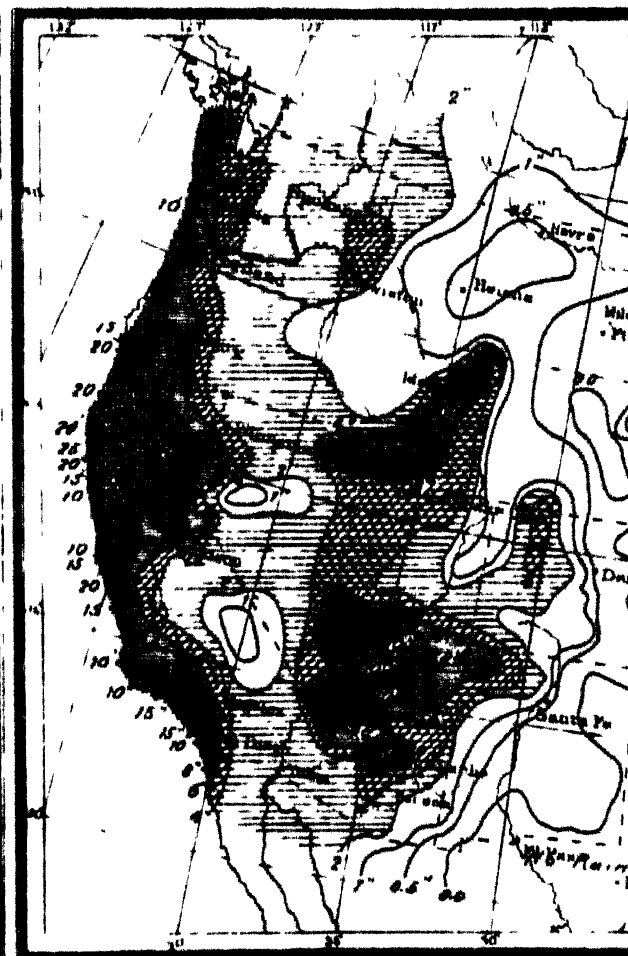
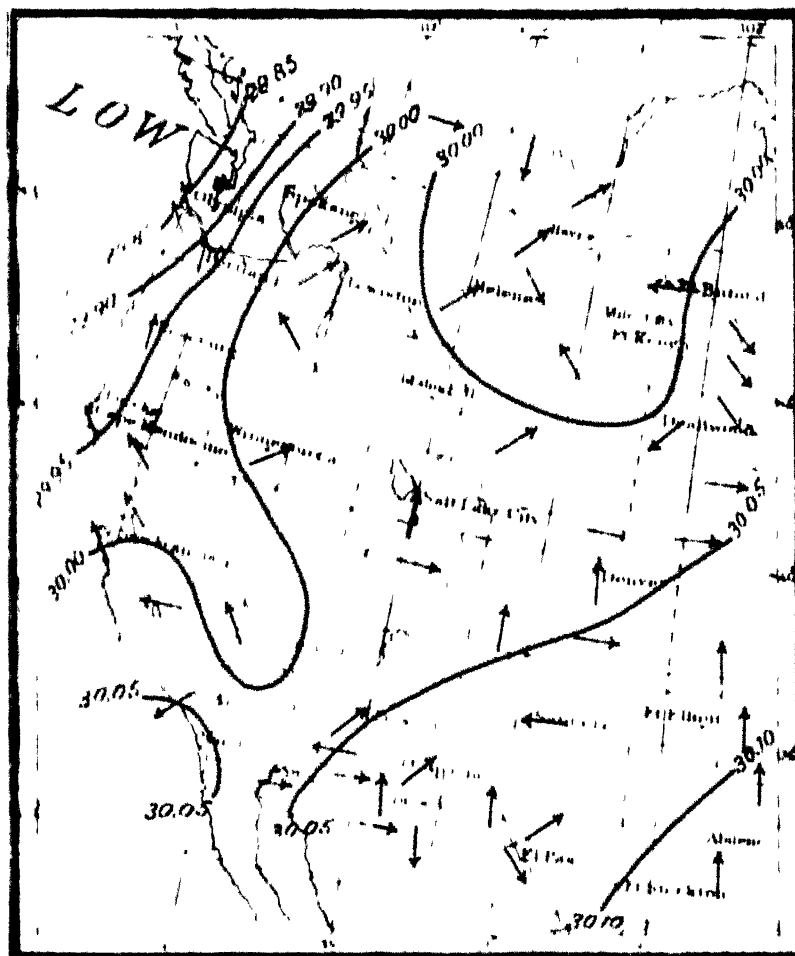
No one who has not lived in California can realize the relief which this generous rainfall of February brought to an anxious community.

The extensive record of rainfall at San Francisco, covering a period of fifty-three years, may be studied to advantage in connection with the pressure distribution. There were six Decembers during which the rainfall exceeded 10 inches, the normal December rainfall being 5 inches. These months were in 1852, 1866, 1867, 1871, 1880, and 1889. The pressure distributions for the earlier years are not available, but the conditions for the month of December, 1880, are characteristic and are shown in detail in the charts here given. The mean rainfall for December at this station is about 5 inches; the greatest rainfall was in 1866, when 15 inches fell. In 1871 14 inches fell. The driest December on record was that of 1876, when no rain fell during the entire month. Pressure charts are not available, but the probability is that the chart would greatly resemble that given for December, 1901. There were seven Decembers in this period in which the total monthly precipitation did not exceed 1 inch.

For January a similar relationship is found to exist. In 1862 the rainfall exceeded 24 inches, or nearly five times the normal amount. In 1866 over 10 inches fell; in 1878 nearly 12 inches, and in 1890 over 9 inches. The driest January of recent years was in 1891, when less than 1 inch fell. The pressure distribution is that of the type shown by 1892 and 1889. For February the mean rainfall is about 3½ inches. In 1878 over 12½ inches fell; in 1887 over 9 inches. In 1891 the February rainfall was 7.26 inches and in 1902, 7.27 inches. It is interesting to note that the pressure charts for these years closely resemble each other over the country west of the Rocky Mountains. On the Atlantic seaboard the pressure distributions are not alike.



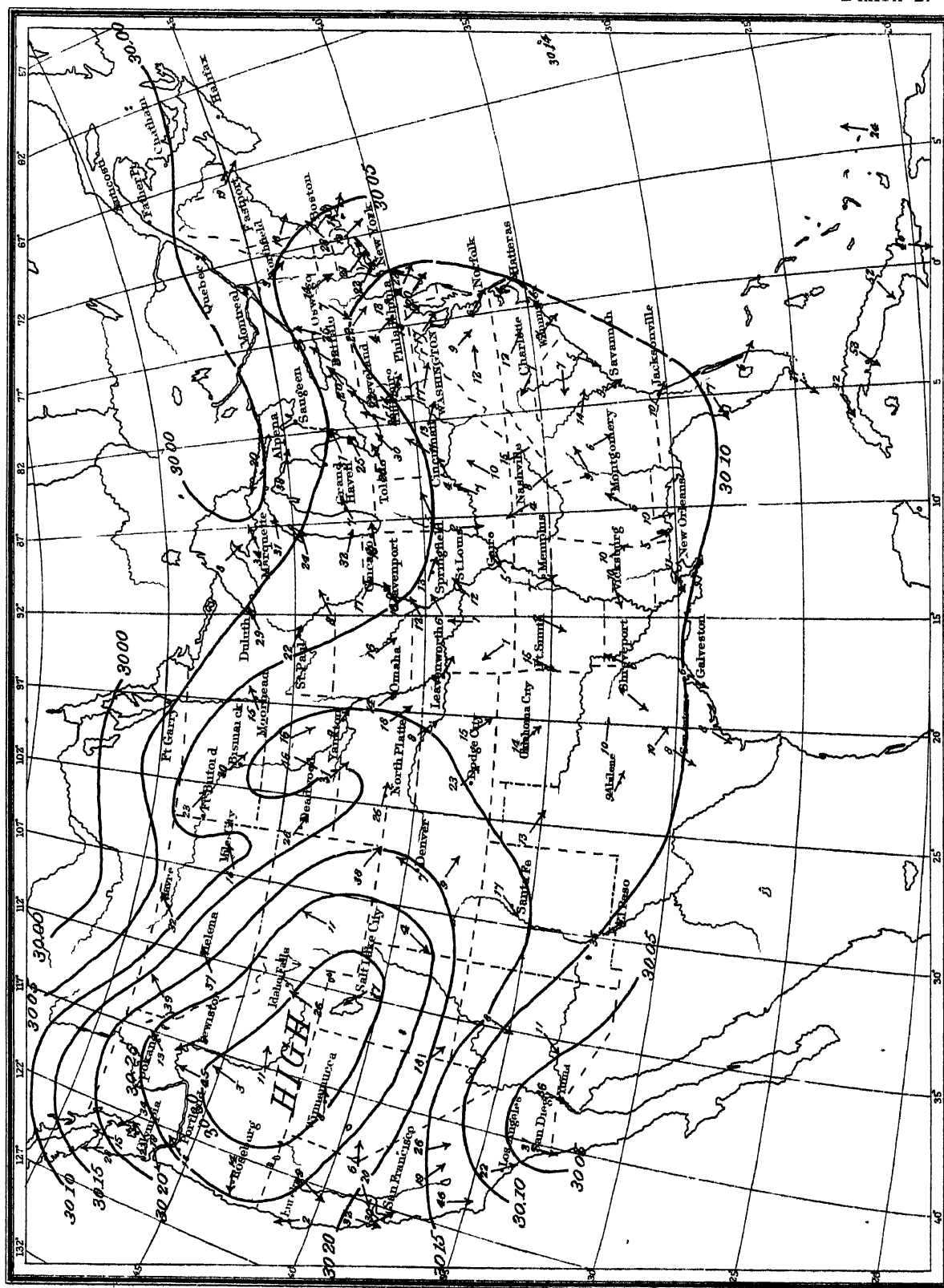
**Pressure, Wind, and Rainfall during a Dry winter month.—January, 1889.**



Pressure, Wind, and Rainfall during a Wet winter month.—December, 1889.



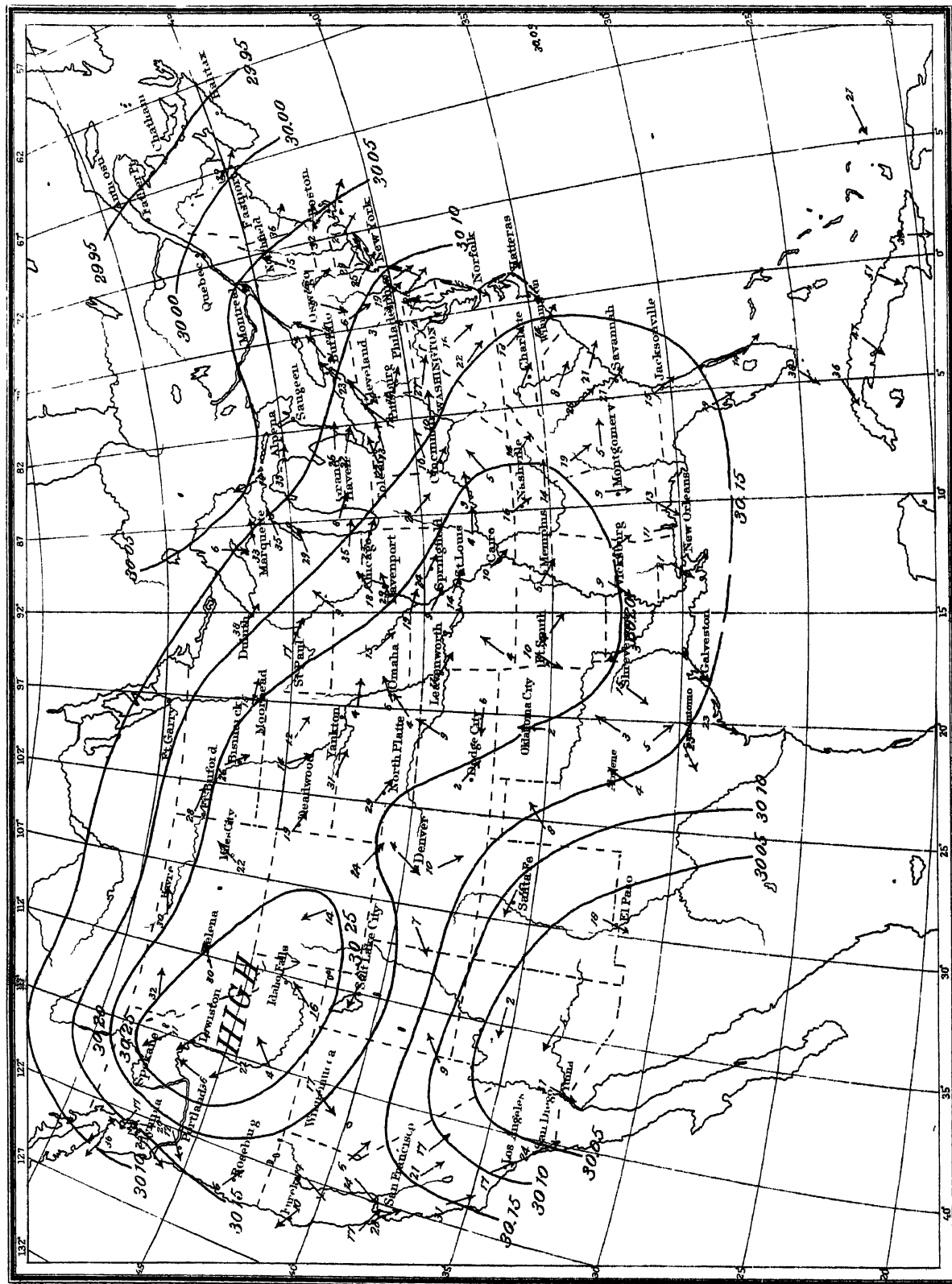
Sea-Level Pressure ; Resultant Surface Winds. December, 1901.





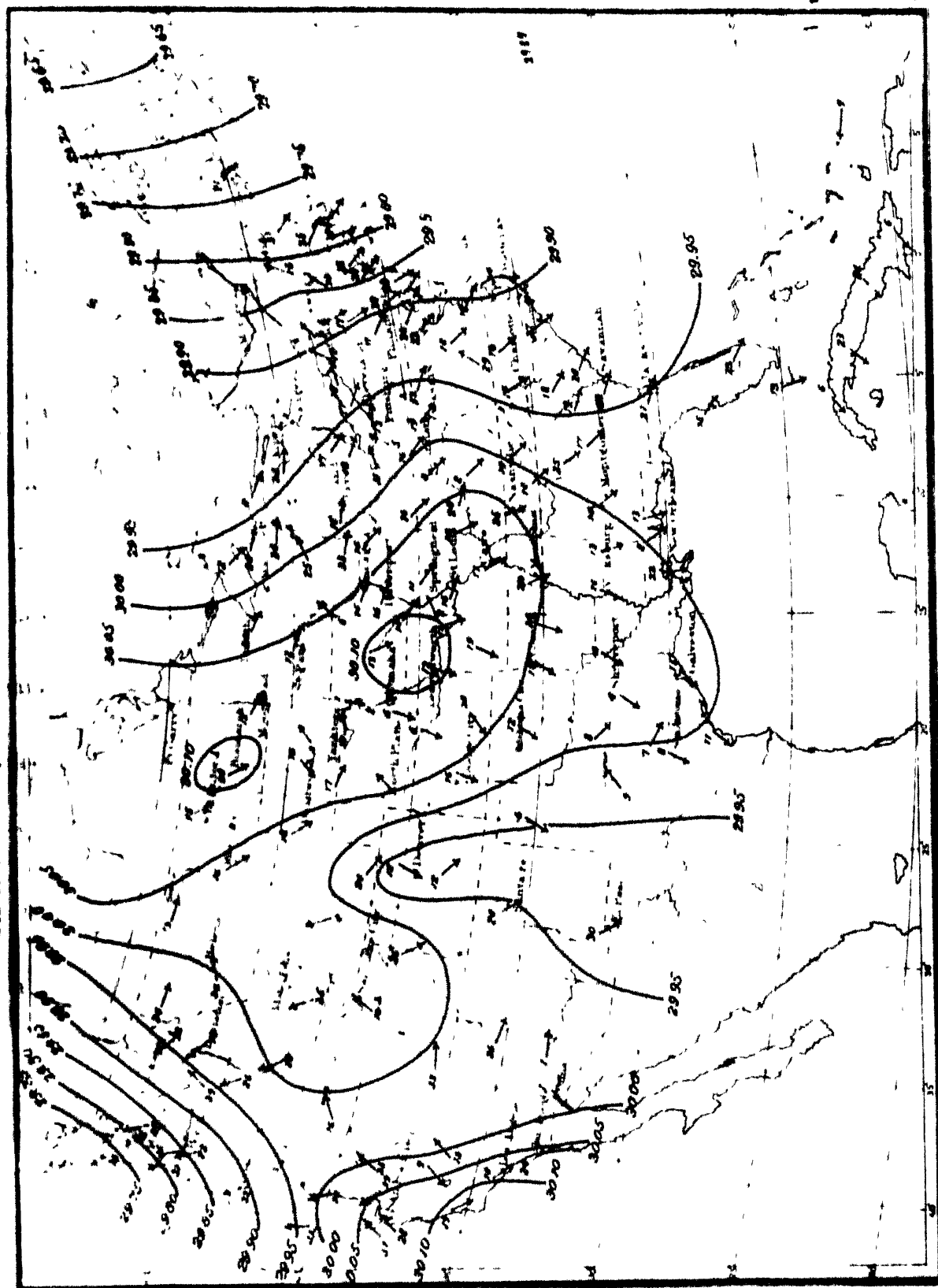


Sea-Level Pressure; Resultant Surface Winds, January, 1902.





Sea-Level Pressure; Resultant Surface Winds. February, 1902.











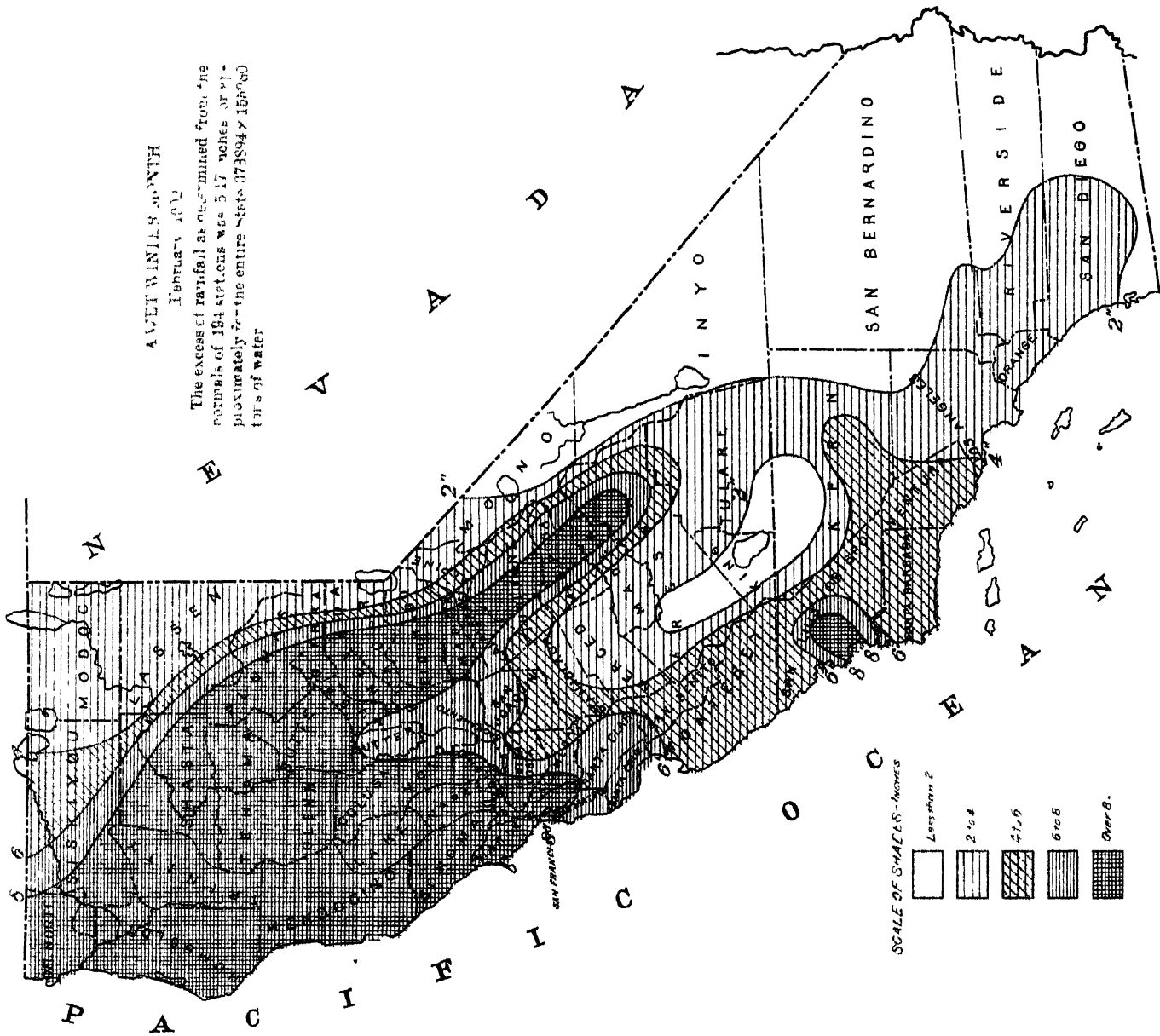




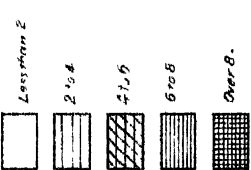
ANNUAL RAINFALL

1914

The excess of rainfall as compared with the normal of 1914 stations was 5.17 inches or 21.1 per cent. The entire area 373,894 x 15,000 feet of water



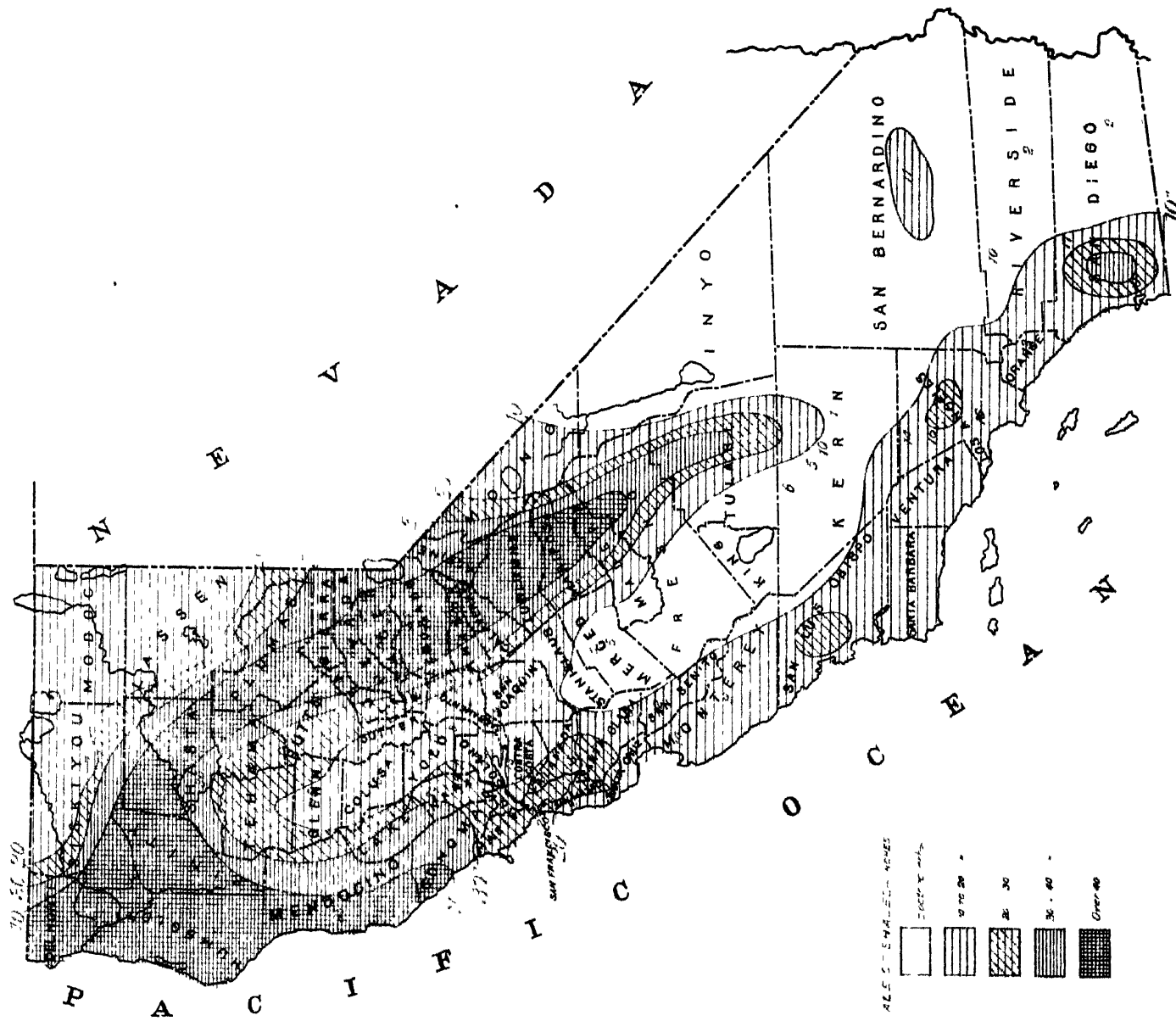
SCALE OF SHADES - INCHES





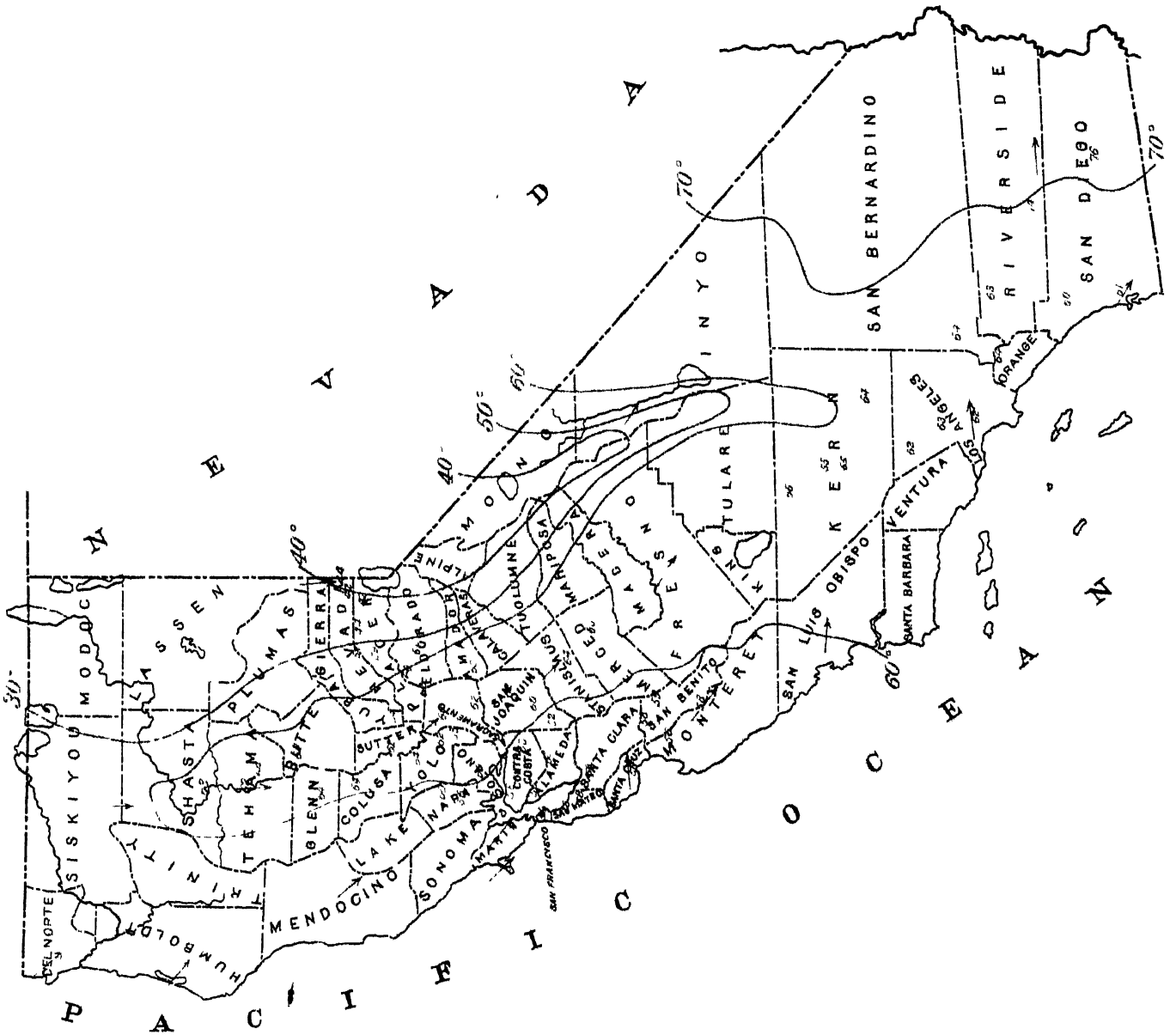
# TOTAL PRECIPITATION

Based on 20 years' records and 1 year of normal rainfall, as determined from all available records.





Mean Annual Isotherms and Prevailing Winds Based on 20 years' normals.





CONTROLLING FACTORS.

9

MONTHLY PRECIPITATION (INCHES AND HUNDREDTHS).

Year	Jan	Feb	Mar	Apr	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual	Season of—	Seasonal.
1849							0.00	0.00	0.00	3.14	8.66	6.20	.. ..	.....	
1850	8.11	1.77	4.23	0.46	0.00	0.40	0.00	0.00	0.38	0.00	0.92	1.05	17.40	1849-50	83.10
1851	0.72	0.54	1.94	1.23	0.67	0.02	0.00	0.02	1.03	0.21	2.12	7.10	15.58	1850-51	7.40
1852	0.58	0.14	6.68	0.26	0.32	0.00	0.00	0.00	0.00	0.80	5.81	13.20	27.29	1851-52	18.46
1853	1.92	1.42	4.86	5.87	0.38	0.00	0.00	0.04	0.46	0.12	2.28	2.82	21.17	1852-53	85.26
1854	1.88	8.04	3.51	3.12	0.02	0.06	0.00	0.01	0.15	2.43	0.34	0.87	22.45	1853-54	23.87
1855	3.67	4.77	4.64	5.00	1.88	0.00	0.00	0.00	0.00	0.00	0.67	5.76	25.39	1854-55	28.76
1856	9.40	0.50	1.80	2.94	0.76	0.08	0.02	0.00	0.07	0.45	2.79	3.75	22.81	1855-56	21.66
1857	2.45	8.59	1.02	0.00	0.05	0.12	0.00	0.05	0.00	0.98	8.01	4.14	20.93	1856-57	19.88
1858	4.86	1.83	5.55	1.55	0.34	0.05	0.05	0.15	0.00	2.74	0.69	6.14	23.46	1857-58	21.81
1859	1.28	6.32	3.02	0.47	1.55	0.00	0.00	0.02	0.08	0.05	7.28	1.57	21.39	1858-59	22.22
1860	1.64	1.00	3.99	3.14	2.85	0.09	0.21	0.00	0.00	0.91	0.58	6.16	21.18	1859-60	22.27
1861	2.47	3.72	4.08	0.51	1.00	0.05	0.00	0.00	0.02	0.00	4.10	9.54	25.52	1860-61	19.72
1862	24.26	7.73	2.20	0.73	0.74	0.05	0.00	0.00	0.00	0.00	0.15	2.85	38.68	1861-62	49.27
1863	3.63	3.19	2.06	1.61	0.28	0.00	0.00	0.00	0.08	0.00	2.55	1.80	15.10	1862-63	13.74
1864	1.85	0.00	1.52	1.57	0.78	0.00	0.00	0.21	0.01	0.13	6.68	8.91	21.64	1863-64	10.08
1865	5.14	1.34	0.74	0.94	0.63	0.00	0.00	0.00	0.24	0.26	4.19	0.58	14.06	1864-65	24.73
1866	10.88	2.12	3.04	0.12	1.46	0.04	0.00	0.00	0.11	0.00	3.85	15.16	36.28	1865-66	22.93
1867	5.16	7.30	1.58	2.36	0.00	0.00	0.00	0.00	0.04	0.20	5.41	10.69	30.64	1866-67	24.92
1868	9.60	6.18	6.30	2.31	0.00	0.25	0.00	0.00	0.00	0.15	1.18	4.84	30.17	1867-68	38.84
1869	6.35	3.90	3.14	2.19	0.08	0.02	0.00	0.00	0.12	1.29	1.19	4.81	22.59	1868-69	31.35
1870	7.89	4.78	2.00	1.53	0.20	0.00	0.00	0.00	0.08	0.00	0.43	3.88	16.24	1869-70	19.31
1871	3.07	3.76	1.05	1.80	0.23	0.01	0.00	0.00	0.00	0.07	2.81	14.86	20.44	1870-71	14.10
1872	4.00	6.90	1.50	0.81	0.18	0.04	0.01	0.00	0.04	0.11	2.79	5.95	22.42	1871-72	30.73
1873	1.58	3.94	0.79	0.43	0.00	0.02	0.01	0.08	0.00	0.83	1.16	9.72	18.56	1872-73	18.02
1874	5.86	2.21	3.36	0.90	0.66	0.14	0.00	0.00	0.02	2.69	6.55	0.33	22.52	1873-74	23.96
1875	8.01	0.32	1.30	0.10	0.22	1.02	0.00	0.00	0.00	0.24	7.27	4.15	22.63	1874-75	18.40
1876	7.55	4.92	5.49	1.29	0.24	0.04	0.01	0.01	0.38	3.36	0.25	0.00	23.54	1875-76	35.01
1877	4.72	1.18	1.08	0.26	0.18	0.01	0.02	0.00	0.00	0.65	1.57	2.66	11.93	1876-77	11.04
1878	11.97	12.52	4.50	1.06	0.16	0.01	0.01	T.	0.55	1.27	0.57	0.58	33.26	1877-78	35.13
1879	3.52	4.90	3.75	1.89	2.35	0.05	0.01	0.02	T.	0.78	4.08	4.46	30.76	1878-79	24.44
1880	2.23	1.87	2.08	10.06	1.12	0.00	0.00	0.00	0.00	0.05	0.33	13.33	30.07	1879-80	35.66
1881	8.89	4.65	0.90	2.00	0.72	0.69	0.00	0.00	0.25	0.54	1.94	3.85	23.73	1880-81	29.86
1882	1.88	2.98	3.45	1.22	0.21	0.04	0.00	0.00	0.26	2.66	4.18	2.01	18.67	1881-82	16.14
1883	1.92	1.04	3.01	1.51	3.52	0.01	0.00	0.00	0.42	1.48	1.60	0.92	15.43	1882-83	30.12
1884	3.94	6.65	8.24	0.33	0.21	2.87	T.	0.04	0.33	2.55	0.26	7.68	38.82	1883-84	32.34
1885	2.53	0.30	1.01	3.17	0.04	0.19	0.08	T.	0.11	0.72	11.78	4.99	24.90	1884-85	18.10
1886	7.42	0.24	2.07	5.28	0.37	0.01	0.23	T.	0.01	1.48	0.84	2.07	20.02	1885-86	33.05
1887	1.90	9.73	0.54	2.30	0.06	0.07	T.	0.01	0.29	T.	0.99	3.34	19.04	1886-87	19.04
1888	6.81	0.94	3.00	0.11	0.38	0.27	0.01	0.01	0.98	0.13	3.99	5.80	23.03	1887-88	16.74
1889	1.28	0.72	7.78	0.90	2.17	0.03	0.01	T.	T.	7.28	2.90	13.81	36.94	1888-89	23.86
1890	9.61	5.16	4.73	1.18	1.07	0.10	0.02	0.00	0.31	0.00	0.00	3.25	25.43	1889-90	45.85
1891	0.98	7.35	1.96	2.44	1.25	0.11	0.10	0.02	0.77	0.04	0.56	5.62	21.11	1890-91	17.53
1892	2.42	2.90	2.85	1.39	1.86	T.	0.00	0.00	0.02	1.65	3.91	5.08	22.06	1891-92	18.53
1893	3.05	2.75	4.08	1.03	0.15	0.08	0.02	0.00	0.21	0.16	4.18	2.23	17.91	1892-93	22.05
1894	5.99	2.69	0.00	0.50	1.31	0.56	T.	0.00	1.05	1.73	0.98	9.01	24.32	1893-94	18.47
1895	6.99	2.31	1.89	1.24	0.80	0.00	0.00	0.00	0.77	0.11	1.78	1.43	17.13	1894-95	27.29
1896	8.14	0.28	2.85	5.16	0.72	0.00	0.00	0.09	0.52	1.55	4.55	4.34	28.25	1895-96	31.25
1897	2.36	4.41	4.58	0.27	0.61	0.22	.....	T.	0.10	1.70	1.05	1.32	15.40	1896-97	23.43
1898	1.12	2.13	0.24	0.19	1.44	0.19	.....	T.	1.06	0.86	0.46	1.62	9.31	1897-98	9.33
1899	3.67	0.10	7.81	0.82	0.56	0.01	.....	T.	0.00	3.92	3.79	2.65	23.23	1898-99	16.37
1900	4.11	0.64	1.91	1.08	0.32	0.05	T.	T.	0.46	1.48	3.91	1.37	15.33	1899-00	13.47
1901	5.79	5.03	0.80	1.64	0.69	T.	T.	T.	0.78	0.54	3.48	0.90	19.75	1900-01	21.17
1902	1.23	7.77	2.65	0.98	1.05	0.00	T.	T.	T.	1.70	1.98	2.32	19.13	1901-02	13.95
Mean	4.85	3.54	3.14	1.92	0.73	0.14	0.02	0.02	0.23	1.05	2.75	4.80	22.76	.....	22.75



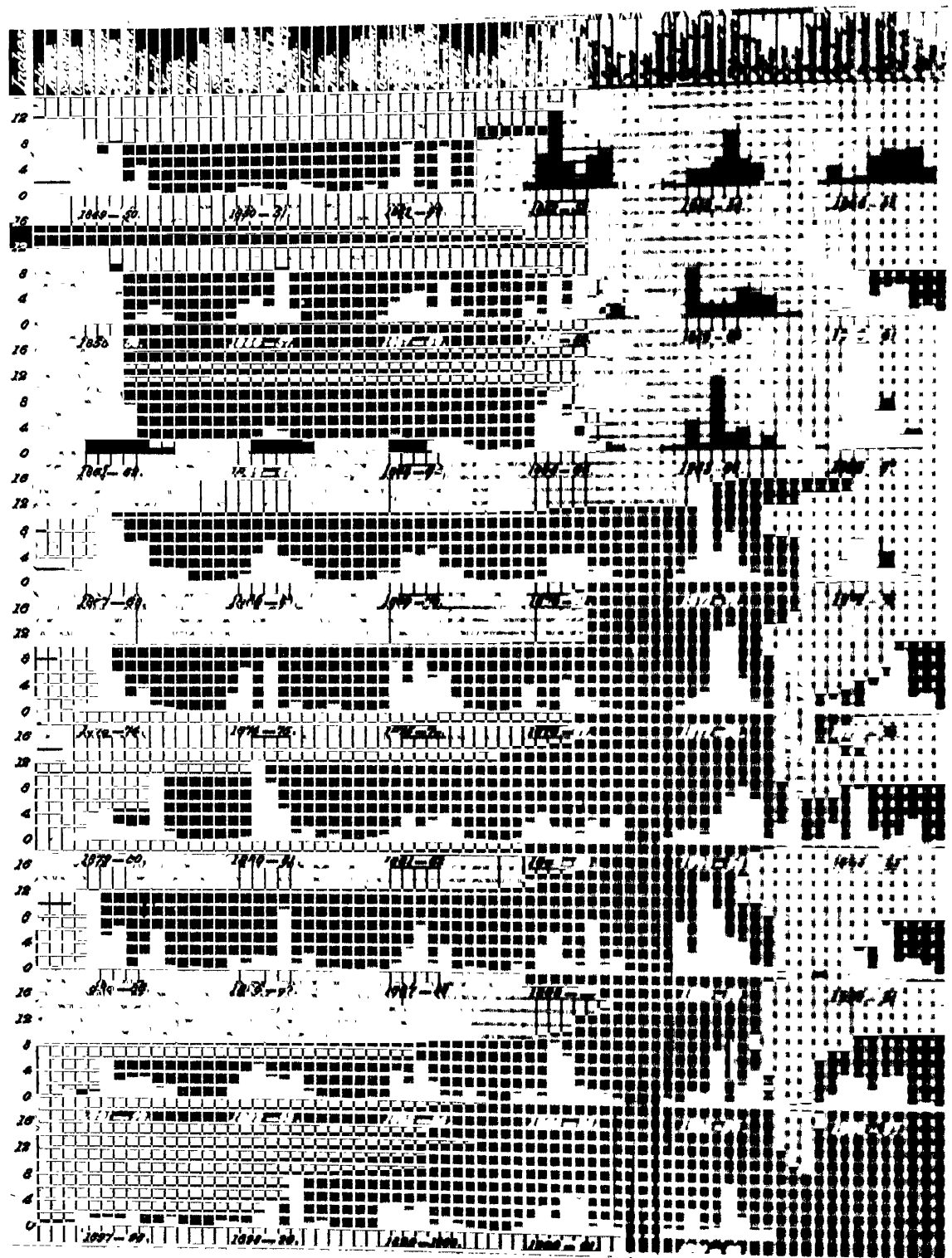


FIG. 1.—Seasonal rainfall at San Francisco, 1893-1922.

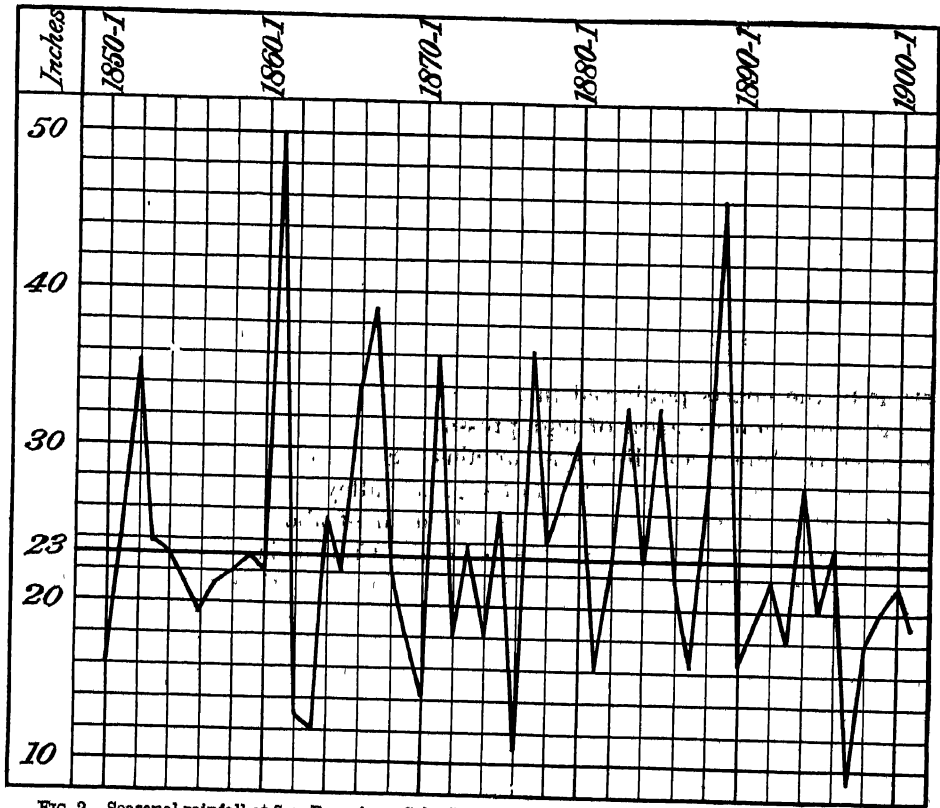


FIG. 2.—Seasonal rainfall at San Francisco, Cal. Intensity or amount in inches. (Normal, 23 inches)

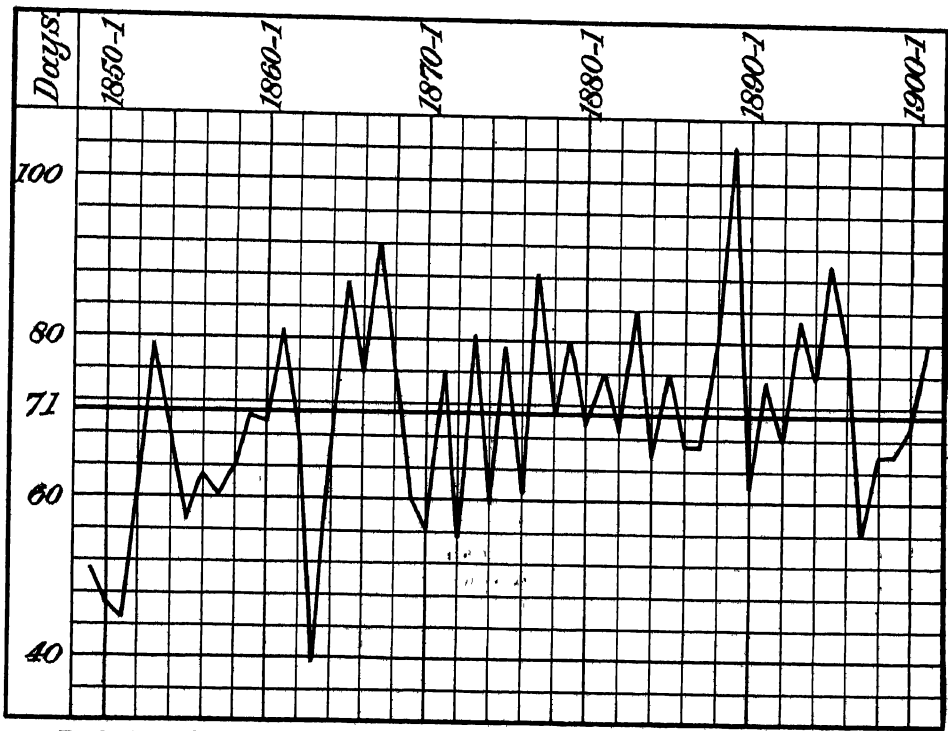


FIG. 3.—Seasonal rainfall at San Francisco, Cal. Frequency, or number of days. (Average, 71 days.)

A study of the charts in the Monthly Weather Review makes plain the positive character of the relationship between pressure distribution and the amount of rainfall. It will probably be found upon investigation that the frequency of rainfall as well as the intensity bear a direct relation to the pressure distribution as described above. In addition to the charts of the Monthly Weather Review excellent material for a further study of these relationships is to be found in the various international bulletins and synoptic charts of the various meteorological services.

The path of storms will be determined by the position of the great permanent areas. When the North Pacific low extends well to the southward in winter the storm tracks are well to the southward. And conversely if far to the north, the mean paths will also be far north.

#### MOVEMENT OF AREAS OF HIGH PRESSURE.

By referring to the charts published in the Monthly Weather Review it will be seen that, especially during winter months, areas of high pressure frequently lag in their eastern march over the country between the Sierra and Rocky Mountains. Such conditions are alluded to elsewhere as being generally accompanied by tule fog in the great valleys with temperatures ranging from  $30^{\circ}$  to  $40^{\circ}$  at sea level and from  $40^{\circ}$  to  $50^{\circ}$  at an elevation of about 1,000 feet. Warm weather with high northerly winds is apt to prevail in southern California during the early part of the winter, while, strangely enough, under somewhat similar conditions of pressure distribution during January and February, cool nights with frost in the morning may be expected in southern California.

During the prevalence of a slow moving area of high pressure it has been found that depressions of moderate depth sometimes develop on what may be called the periphery of the high to the south and southwest. During the months of November, December, and January under such conditions rain will begin falling without much warning along the coast from Point Conception southward. The forecast official can from the very nature of things give but little advance warning of such disturbances.

#### MOVEMENT OF AREAS OF LOW PRESSURE.

##### STORMS OF THE WEST PACIFIC OCEAN.

A discussion of these storms falls more properly under the province of the Hydrographic Office; but so interesting are the few facts which are fairly well established that brief mention must be made of them. The typhoons of the West Pacific have been studied with much care and skill by the staff of the observatory at Manila, and particular mention must be made of the work of the director of the observatory, P. José Algué, S. J., and P. Juan Doyle, S. J., subdirector of the observatory. Algué's "Baguios ó Ciclones Filipinos" and Doyle's "Tifones del Archipiélago Filipino y Mares Circunvecinos" are the best contributions to the subject.

Excellent directions for mariners and much information of a practical character is to be found in *The Law of Storms in the Eastern Seas*, by W. Doberck, director of the observatory at Hongkong. The observatories at Tokyo and Shanghai have also collected much material relating to storm development and motion on the Asiatic coast. Reference should also be made to the work of Dr. Paul Bergholz, director of the meteorological observatory at Bremen, who has given special attention to the storms of the East Indies. A translation of an address by this author on "The origin, paths, and limiting zones of the typhoons of the Orient," by Professor Abbe, was published in the Monthly Weather Review for September, 1899, and an abstract of this follows:

## TYPHOONS OF THE PACIFIC OCEAN

The following table shows at a glance a classification of the hurricanes of the Pacific Ocean.

*Typhoons of the Pacific Ocean*

Group	Months	Trend of first branch, <sup>a</sup>	Latitude of vertex of parabola	Trend of second branch
1. .	December . . . .	North-northwest . .	15-19	North-northeast
	January . . . . .			
	February . . . . .			
	March . . . . .			
2. . . . .	April-May . . . . .	Northwest . . . . .	16-21	Northeast.
	May . . . . .			
	October . . . . .			
	November . . . . .			
3. . . . .	June . . . . .	Northwest by north,	21-25	Northeast by east
	July . . . . .			
	August . . . . .			
	September . . . . .			

<sup>a</sup>Namely, when passing the small circle of latitude for Manila

In general, the paths of these hurricanes are all parabolic. The average trend of the paths or the inclination to the meridian is much larger when they pass the latitude of Manila ( $14^{\circ} 35'$  north) than the average trend in the first branch. This is particularly noticeable during the months of the first group, and this evidently results from the fact that the latitude of the intersection [vertex?] of the path agrees very nearly with the latitude of Manila.

If now, with the assistance of the charts of isobars, we determine the conditions under which the cyclones are formed in the different months and groups of months, we find.

(a) The paths of the hurricanes of the Pacific Ocean in the first group start from the region between two areas of high pressure, one of which lies over the continent, the other over the Pacific Ocean. They lead toward the center of low pressure that occupies a portion of Bering Sea. The hurricanes of the China Sea keep within lower latitudes, namely, those which are reached by the limiting isobars of the Asiatic center of high pressure. In proportion as the centers of high pressure flatten out and withdraw during the period from January to March, so these extreme isobars retreat toward the north, and consequently the paths of the hurricanes extend farther north.

(b) With reference to the second group, the charts of monthly isobars show that the hurricanes of the Pacific Ocean in April and May move between the extreme isobars of the high-pressure areas of the Pacific Ocean and Asia.

(c) The paths of the hurricanes of the China Sea keep south of the isobar 760 mm., belonging to the high-pressure area of Asia and the low-pressure area of Hindostan. In October and November, in proportion as the Asiatic high-pressure area develops, these are pushed more and more into lower latitudes, moreover, the development of the area of low pressure in Hindostan is an index to these paths.

(d) The hurricanes of the Pacific Ocean, especially in October, pass along the broad zone between the Philippines and Japan, on the one hand, and the isobar of 760 mm. surrounding the high-pressure area of the Pacific. In November this zone becomes narrower by reason of the further development of the continental area of high pressure. The hurricanes of the Pacific Ocean belonging to this group also pursue paths toward the depression in the extreme north, which bears north-northeast from Manila.

(e) It is characteristic for the months of the third group that from June to September, at least to the middle of the latter month, the center of high pressure withdraws from the coast of Asia, and finally disappears. In connection with this the paths of the hurricanes attain higher latitudes, and those of the Pacific Ocean recurve very near the meridian of  $125^{\circ}$  east, therefore nearer to the Philippines than in the previous months. A single exception offers in the case of the hurricanes of the second half of September, whose recurring points are from  $5^{\circ}$  to  $8^{\circ}$  farther east. All hurricanes in the Pacific Ocean have as their ultimate destination the northern center of low pressure. The paths of the hurricanes of the China Sea trend more toward the north in proportion as the high pressure area of the continent moves northward, and do this, therefore, up to the end of August and the beginning of September, if, however, the low-pressure area moves toward the south about the beginning of September, then also the paths of these cyclones must follow it. Some of the July hurricanes after recurring follow paths going very nearly northward, they cross over the Yellow Sea and travel toward a small center of low pressure that has developed in Siberia.

The reader who is interested in the movements of the storms of the Asiatic coast may read with profit Bulletin H, Weather Bureau, 1900, on West Indian Hurricanes, by Prof. E. B. Garriott, since the typhoon on the Pacific Ocean and the hurricane of the West Indies are storms of the same general character and have much in common.

During the years 1895, 1896, and 1897 the Weather Bureau office at San Francisco made an attempt to trace the path of a disturbance across the ocean. By means of a large number of ship reports obtained through the courtesy of the Hydrographic Office the approximate path of a disturbance was determined. On the accompanying chart there is shown the path of a disturbance covering a period extending from November 20, 1895, to January 14, 1896. This path was determined by Prof. W. H. Hammon.

It may also be of interest to present a section of the same disturbance in its passage just preceding and following the point of recurvature.

To illustrate the difficulties of forecasting on the Pacific coast owing to the absence of reliable data over the ocean, the accompanying charts showing a forecast official's map with the conditions existing on the morning of January 18, 1896, and the real condition as subsequently determined by plating the observations of ships traversing the North Pacific. It is interesting to notice that a forecast of "rain" for the ensuing thirty-six hours might with the fuller knowledge obtained later have been changed to a long-range forecast covering a period of many days. As a matter of fact, there was no rain reported at San Francisco during the first twelve days of the month of January, 1896; but rain fell on every day from the 13th to the 21st and the total rainfall for this month was 8.14 inches, or nearly double the normal January rainfall.

#### LOW AREAS ON THE PACIFIC COAST.

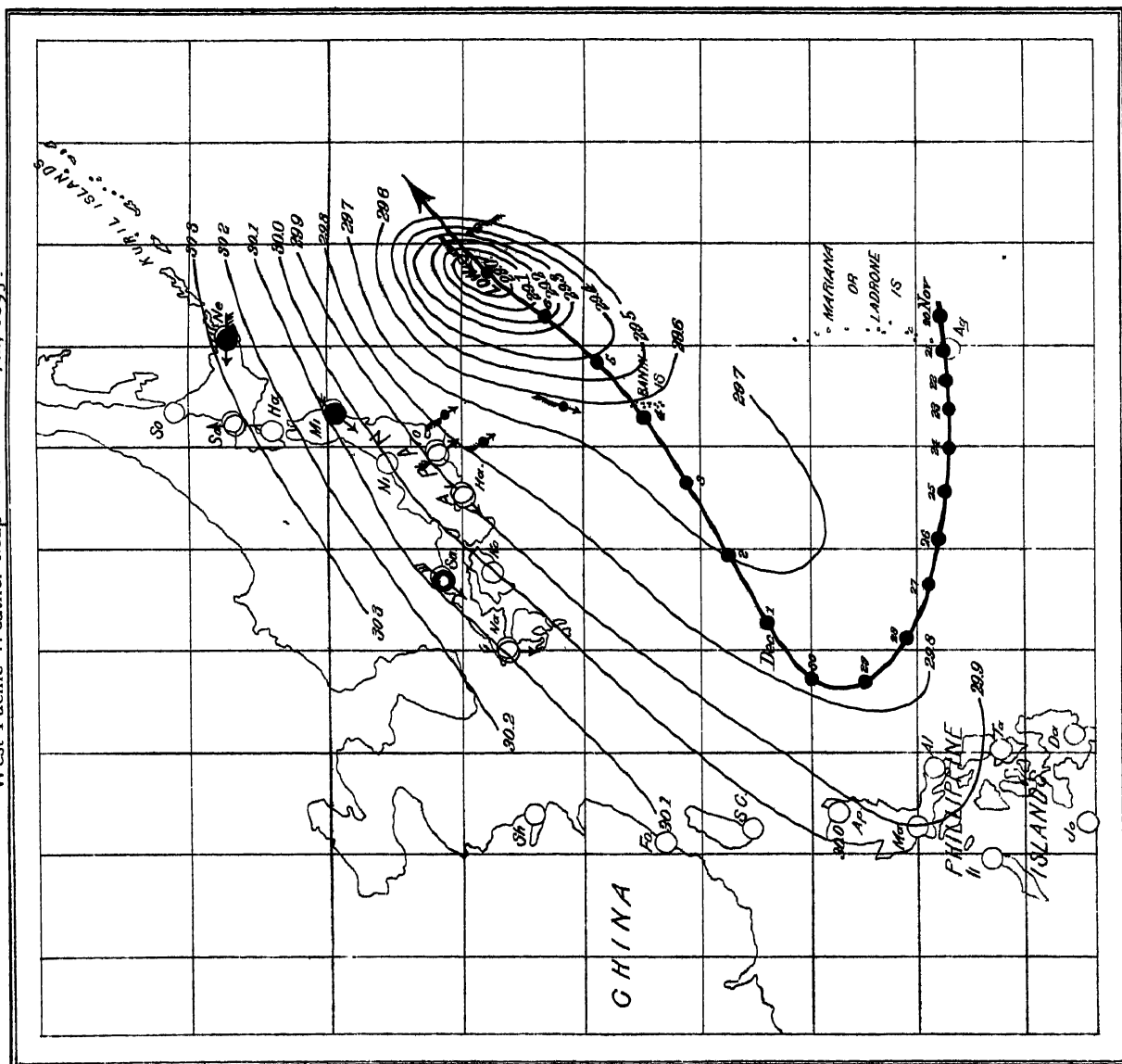
Professor C. Abbe, in *Monthly Weather Review*, November, 1894, states that

The daily chart for the northern hemisphere accompanying the bulletin of international observations for the logical observations, 1875-1887, has long since familiarized the student with the fact that areas of low pressure frequently pursue very long paths for many consecutive days in their circuit around the north temperate regions. Those that start in the equatorial portions of the Atlantic or Pacific, after passing northwest and curving to the northeast, finally move east-northeastward between the forty-fifth and sixty-fifth parallels. Others start in the temperate regions and without moving to the westward or recurving, pursue nearly the whole path in an east-northeast direction. In describing the history of areas of low pressure the authors who have contributed chapters to the successive *Monthly Weather Reviews* for nearly twenty-five years past have usually kept in mind the fact that "low" which first appears in Washington, Oregon, Montana, and Alberta, or British Columbia, have probably originated at some point far to the west, and if occasionally the description of such a storm begins by speaking of it as originating over the North Pacific slope region, this is a slip of the pen which the reader may generally interpret without being misled by it.

On several occasions I have pointed out the fact that the isobars, and therefore the winds of a cyclonic disturbance above the earth's surface, have very little resemblance to the isobars and winds at our level. In fact, the normal isobars at an elevation of 5,000 meters (which represents a surface a little above the summit of the Rocky Mountains) present a grand oval depression whose longest axis extends from the United States toward the north-northwest over the Saskatchewan and the Arctic regions to eastern Siberia. By studying a polar projection of the northern hemisphere we perceive that the whole upper circulation of winds and clouds and the general movement of areas of low pressure and high pressure are related to this distribution of pressure in the upper layers of air. When a storm center moves from Japan to the North Pacific, or from the latter to our Pacific coast, or from Alaska and Oregon southeastward, or from Texas and Kansas northeastward, it is describing some portion of a circuit about this great upper region of low pressure. It is simply a special whirl gliding about in the maelstrom that occupies one-half of the northern hemisphere. The axis of this oval polar maelstrom probably changes its position with considerable regularity, oscillating slowly to and fro; therefore the paths which the smaller disturbances describe will vary simultaneously with that; sometimes the storms will move far to the south either in America or in Europe in order to circumnavigate the southern extension of the longer axis of the oval; but will thereby diminish in intensity and almost die out. Sometimes a new whirl will start at the southern end of the oval, sometimes all the paths of the low areas will lie on the northern border of the United States and Canadian weather charts because the polar maelstrom has altered its dimensions and locations. Even the great subpermanent areas of low pressure in the North Atlantic and North Pacific are subordinate to the greater area of low pressure at the upper level and its attendant winds.

These remarks were made in discussing the following notes by Professor McAdie, Henry, and Hammon bearing upon the origin and paths of areas of low pressure on the Pacific coast:

A little study of weather types on the Pacific slope makes it plain that certain conditions traverse the country from the Pacific; thus to take at random the month of January, 1896, some of the deep lows that might have been supposed to originate over Manitoba or farther west over Assiniboia, Alberta, and British Columbia did not so originate, but are storms that can be traced distinctly in their onward march from the north Pacific Ocean northwestward, often recurving and doubling in their paths, but preserving identity. Fanning south of Alaska they



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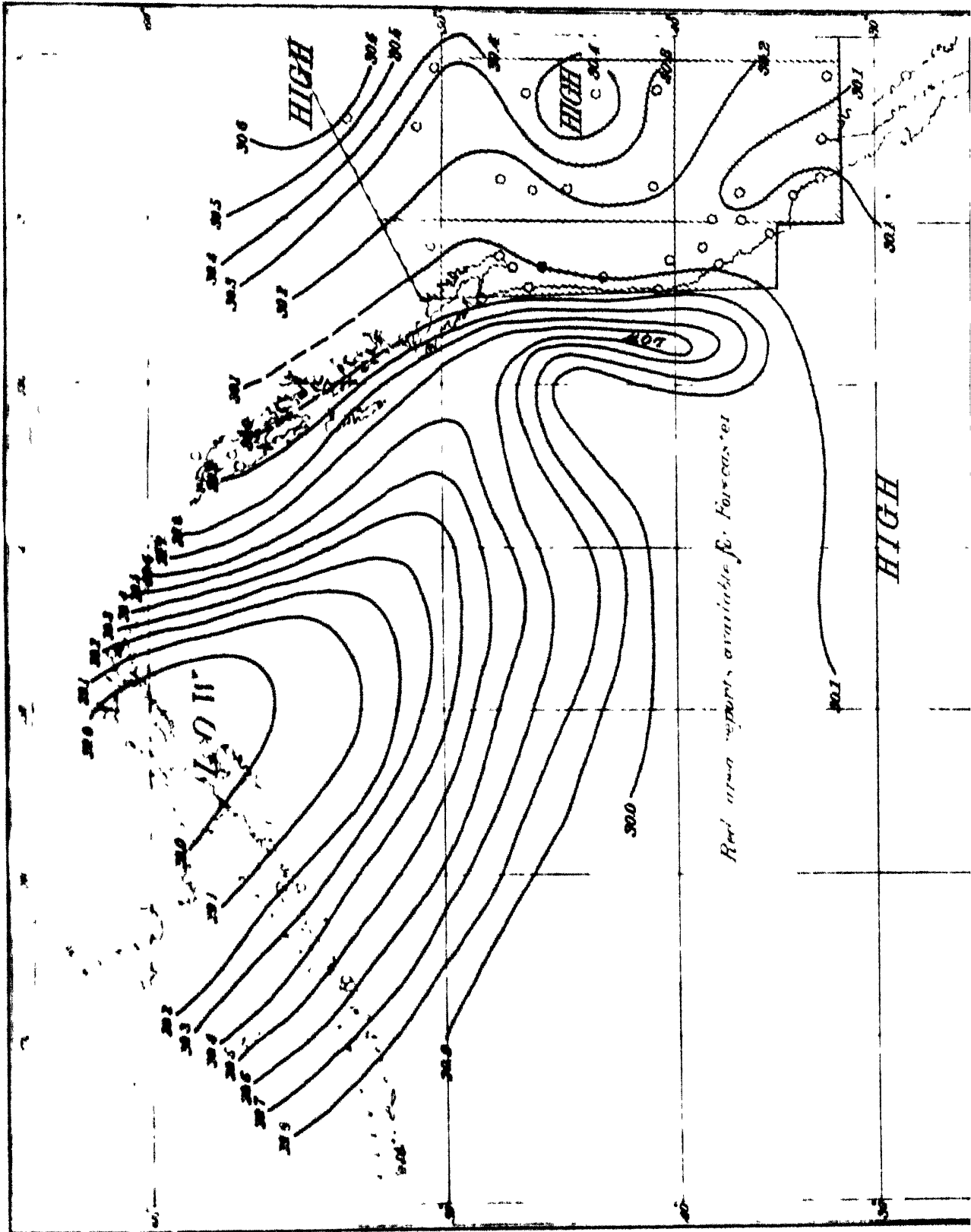
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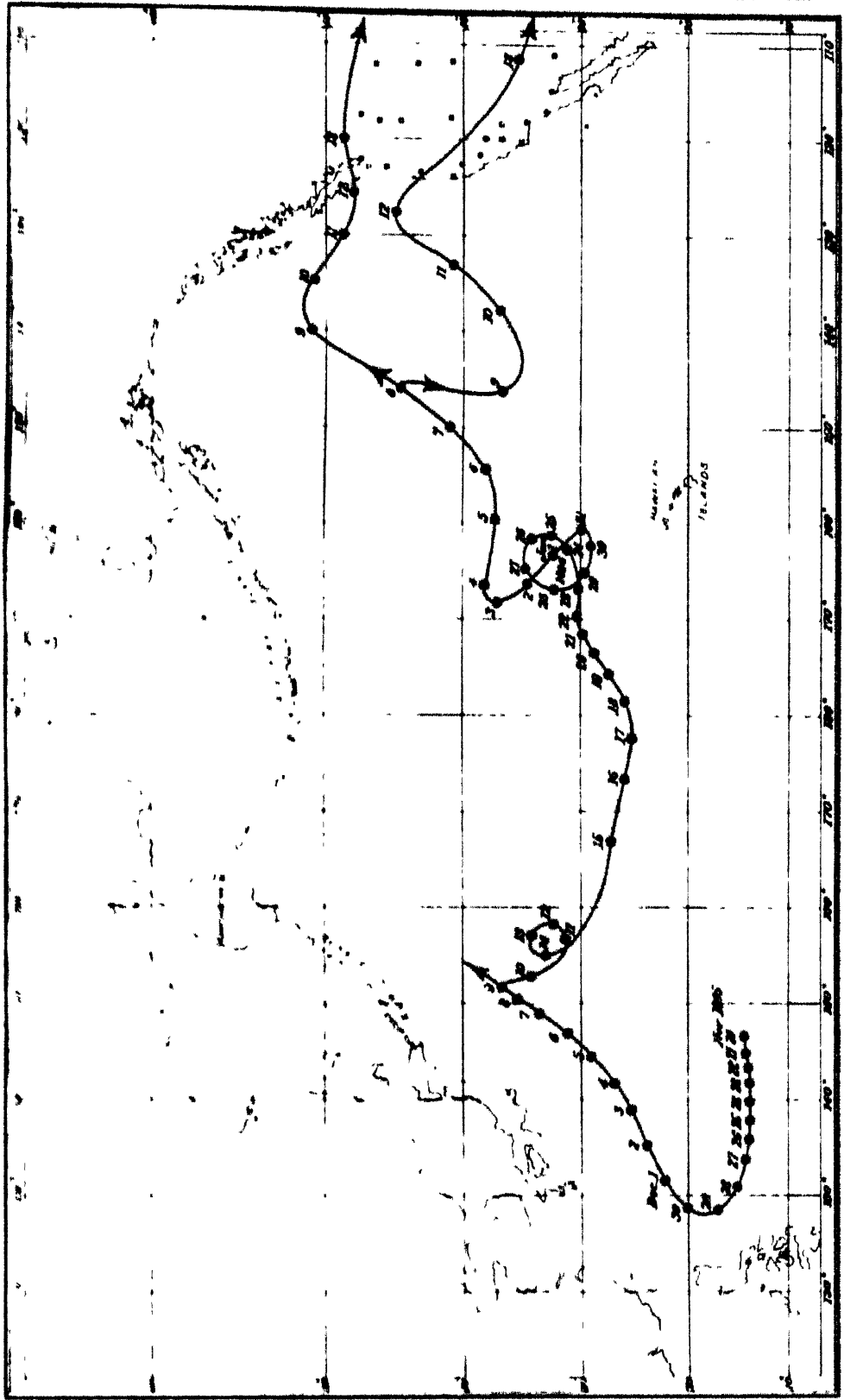
Daily Weather Chart—Pacific Ocean  
Probable conditions January 11th, 1899. Noon Greenwich







Climate of California - Approximate Path of Disturbance  
Traversing Pacific Ocean



march eastward and reach Newfoundland in about one hundred and twenty hours. For example, a storm passed from Sitka to St. Johns between January 12 and 17. This storm did not originate in the Northwest Territory, but clearly came in from the Pacific. Where it did originate we do not know, but it is an error to locate its origin in any of the Northwest territories. And this is probably true of most storms which are said to originate over Athabasca or Saskatchewan. The truth is that storms first come into notice in these localities, but originate elsewhere.

\* \* \* \* \*

The storms of the Pacific coast present a characteristic that is worthy of special study, viz, an apparent oscillation from the ocean to the land, and vice versa; that is to say, the low approaches the coast and partially disappears, reappearing within a period of twelve to thirty-six hours, and continuing this action until the storm finally disappears.

\* \* \* \* \*

During the past two years I have been engaged, during my leisure time, in preparing weather charts of the Pacific Ocean. Some remarkable information has been obtained from these charts. The storms that approach the Pacific coast from the ocean frequently recur several times after touching the coast, the number of oscillations being greater the farther south the storm approaches the coast.

\* \* \* \* \*

Professor Abbe holds that—

The fact that a storm moves southward, ricocheting along the Pacific coast, and probably dying away as it progresses, harmonizes with the general theory of the movement of vortices. If the general distribution of pressure at sea level, and especially at 16,000 feet, is such as to give the storm center a general movement southward or southeastward along the Pacific coast, then the influences of the high mountain land in the interior of California and the plateau lands of Idaho, Nevada, Oregon, Utah, and Arizona are like those of a barrier against which a small atmospheric vortex may strike, only to be reflected several times in succession. A further special influence of these high lands is to furnish descending dry air whose mixture with the moist air of the whirlwind rapidly diminishes the quantity of condensation and the sustaining power of the whole mechanism. The inverse conditions prevail on the east slope of the Rocky Mountains, where, therefore, a whirl once started is apt to increase in all characteristic phenomena. Possibly this process is illustrated by the low area of October 29, 1896, in regard to which Professor McAdie writes: "On Monday, October 28, 1896, a. m., a low, 29.70, with southeast winds, appeared on the Oregon coast. Taking a most unusual course, this storm passed southward and on the morning of the 27th was over central California (San Francisco, 29.56, southeast wind, 1.10 inches rainfall). By 10 o'clock of the same day the storm was moving down the San Joaquin Valley, and heavy rain was falling over southern California. On the morning of the 28th the pressure was 29.78 at El Paso, with rain, and the storm was out of our limits of observation, but just coming into prominence elsewhere."

#### PREVAILING AIR DRIFT AND OCEAN EFFECT.

The prevailing easterly drift of the atmosphere in temperate latitudes, causing the well-known winds from the west, is one of the prime factors in modifying the climate of the coast of California. This coast line, stretching for 10 degrees of latitude, is subjected to a steady indraft of air from the west. In this movement, together with the fact that to the west is the great Pacific Ocean, lies the secret of the difference in temperatures between the Atlantic and the Pacific coasts at places of like latitude. For some years there has been an impression that the milder climate of the Pacific coast was due to a warming influence of the Kuro Siwo, or Japan current. No reliable data exist to support such a belief, and it is quite unlikely that the Japan current plays any important part in modifying the climate of the Pacific coast. The active factors are, as said above, the prevailing easterly drift of the atmosphere and the proximity of the mass of water, a great natural conservator of heat. Further on, the equability of the mean annual temperatures along the coast of California, a distance of nearly 1,000 miles, is discussed, and the area might be extended to include practically the whole of the Pacific coast. One of the most noticeable differences between the climate of the Atlantic and Pacific seabords is found in the trend of the isotherms, those of the Atlantic coast corresponding more or less with the parallels of latitude, while on the Pacific coast the isotherms run more nearly like meridians. Too much emphasis can not be laid upon the effect of these two factors, the easterly drift of the air and the proximity of the ocean in modifying climate. It is probable that if one of these conditions could be reversed and the general movement of the air in these latitudes be from east to west, marked differences in climatic conditions would result, and the Pacific coast might then have a rigorous climate.

## TOPOGRAPHY.

The State of California extends from latitude  $32^{\circ} 40'$  north to  $42^{\circ}$  north with a mean length of something less than 800 miles. The average width of the State is about 200 miles, and it has an area of 155,980 square miles, or 99,827,200 acres. The coast line of the State corresponds in position to that portion of the Atlantic coast extending from Boston to Savannah. Very few rivers, however, empty into the ocean, and in both topography and hydrography there is but little resemblance between the Atlantic and Pacific seaboard. The mountain ranges and other marked physical features play an important rôle in determining local climates, a discussion of which in detail will be given further on. It will not be out of place at this point, though, to call attention to the fact that the highest and lowest lands in the United States, excluding Alaska, are in California. Mount Whitney has an elevation of 4,427 meters (14,522 feet<sup>a</sup>); Mount Shasta, 4,383 meters (14,380 feet<sup>b</sup>); and by referring to the table of elevations<sup>c</sup> it will be seen that we know of at least 43 well-defined mountain peaks with elevations exceeding 3,048 meters (10,000 feet). On the other hand, at Salton and Volcano the depression is 80 meters (263 feet) below sea level. Death Valley, the bed of an old lake about 75 miles long and 6 miles wide, lies in southeastern California, just north of the great Mohave Desert.

A few illustrations showing the diversity of climatic conditions may be of interest. In the Colorado Desert, in the southern portion of the State, shade temperatures as high as  $54^{\circ}$  C. ( $130^{\circ}$  F.) have been recorded. Mean monthly temperatures not much below  $38^{\circ}$  C. ( $100^{\circ}$  F.) frequently occur at Volcano, Salton, Indio, Mammoth Tank, and other places in the great arid regions of southern California, and particularly in the Valley of the Colorado. In the Sierra, just north of Lake Tahoe, temperatures as low as  $-34^{\circ}$  C. ( $-30^{\circ}$  F.) have occurred. During the winter of 1898 a minimum thermometer exposed on one of the high Sierra peaks, Mount Lyell, recorded  $-27^{\circ}$  C. ( $-17^{\circ}$  F.). During the same period the temperature at Bodie reached a minimum of  $-34^{\circ}$  C. ( $-30^{\circ}$  F.).

The mean annual rainfalls, as might be expected, vary from 1 inch to 75 inches. At Mammoth Tank for twenty-three years the mean annual rainfall amounts to 1.81 inches, but here and at other stations there have been years when the rainfall did not exceed a trace.

At Upper Mattole the average annual rainfall is 81 inches, and in individual years rainfalls approximating 100 inches have occurred. The following are some single year rainfalls: Laporte 120 inches, 1896; 101 inches, 1898. Bowman's Dam 119 inches, 1884; 110 inches, 1896. Delta 111 inches, 1889; 100 inches, 1896. Upper Mattole 102 inches, 1896; 101 inches, 1889. Edmonton 102 inches, 1896. Snowfall is confined in general to the central and northern portions of the State and to the mountains of the south. At Summit an annual snowfall of 697 inches has been reported.

The coast line of nearly 1,000 miles shows a difference of but  $10^{\circ}$  F. in the mean annual temperatures of its northern and southern limits. At Eureka the temperature is  $11^{\circ}$  C. ( $51^{\circ}$  F.); at San Francisco,  $13^{\circ}$  C. ( $56^{\circ}$  F.), and at San Diego  $16^{\circ}$  C. ( $61^{\circ}$  F.).

That the coast climates are very equable is shown by the following mean monthly departures. At Eureka the mean January temperature is  $46^{\circ}$ , or a departure of  $5^{\circ}$  from the annual mean; at San Francisco the mean January temperature is  $50^{\circ}$ , or a departure of  $6^{\circ}$  from the annual mean, and at San Diego the mean January temperature is  $54^{\circ}$ , or a departure of  $7^{\circ}$  from the annual mean.

Similarly for the month of July the temperature at Eureka is  $56^{\circ}$ , or  $5^{\circ}$  above the annual, at San Francisco,  $59^{\circ}$ , or  $3^{\circ}$  above the annual, and at San Diego  $68^{\circ}$ , or  $7^{\circ}$  above the annual.

The highest mean annual temperature found in the Colorado Desert is about  $78^{\circ}$ , and the lowest mean annual temperature for stations in the Sierra (Summit, for example) is  $42^{\circ}$ , or a total annual range of  $36^{\circ}$ .

The absolute range as stated above is from  $130^{\circ}$  F. ( $54^{\circ}$  C.) to  $-30^{\circ}$  F. ( $-35^{\circ}$  C.);  $160^{\circ}$  F. ( $89^{\circ}$  C.)

<sup>a</sup> Authority, Langley<sup>b</sup> Authority, U S Geological Survey<sup>c</sup> Authority, The Sierra Club, of San Francisco.

The various elements of sunshine, humidity, wind velocity, and direction vary in different parts of the State to almost as great a degree as rainfall and temperature. Unfortunately continuous and systematic records of these elements are not available for most portions of the State.

The general movement of the air over the State is from the west and north, with strong southeasterly indrafts during the months of November, December, January, and February whenever marked cyclonic disturbances approach the State from the northwest. The general movement of the air in California is decidedly modified and certainly in the lowermost strata almost entirely controlled by the topography. Particularly interesting are the accentuated movements in the great valleys, as shown in the well-known "northers" of May and June. The prevailing westerly winds, wherever allowed access to the interior through gaps in the Coast Range, are greatly intensified and exhibit in both frequency and duration a well-marked relation to the temperatures prevailing in the interior.

One of the most trying climatic conditions prevailing in California is the so-called "norther" or hot north wind which, blowing in the great valleys, is both injurious to ripening crops and irritating to man and beast. May, June, and July are the months of greatest frequency. The condition is as a rule associated with the presence of an area of high pressure over the North Pacific Ocean and a deepening of the usual summer "low" over southeastern California and the Valley of the Colorado. Temperatures of 43° C. (110° F.) or more occur under these conditions. As these brisk northerly winds are very dry and dust laden, ripe fruit and wheat are seriously injured, while human beings and stock suffer greatly because of the irritating effects of the "norther."

In southern California a somewhat similar condition is known as the "Santa Ana." In all of these cases the air has been dynamically heated and dried, either by descensional movement, as when flowing down the mountains or by horizontal movement over superheated plains and deserts.

In the tabulated data which appears further on it will be noticed that the general conditions of temperature and rainfall are greatly modified by the local topography. In California, perhaps more so than in any other part of the habitable earth, a great diversity of climate exists. Within comparatively short distances one may pass from a climate requiring the lightest of summer garments to one requiring overcoats and heavy wraps. A short study of a relief map of California will throw much light on the cause of the great diversity of climate. The subject is discussed in detail in the chapter upon the "Climate of San Francisco," where a marked modification of the normal conditions is undoubtedly affected by the peculiar topography of the locality.

TABLE OF ELEVATIONS EXCEEDING 1,000 METERS (3,281 FEET) IN CALIFORNIA.

Many of the elevations have been supplied by Prof. George Davidson and J. N. Le Conte. For peaks in the High Sierra not included here see supplementary tables.

[Abstracted from Sierra Club's Publication No. 80.]

Place	County	Elevation.		Latitude.	Longitude.	Authority.
		Meters.	Feet.			
Adams Peak	Sierra	2,670	8,782	39 54	120 7	Wheeler.
Alder Hill	El Dorado	2,378	7,795	38 37	120 15	U. S. G. S.
Alpine Peak or Round Top	Amador	3,179	10,430	38 39	120 00	Do.
Angels Peak	El Dorado	2,629	8,625	38 52	120 4	Do.
Ararat Mountain	Plumas	1,840	6,036	39 49	121 8	Do.
Argus Peak	San Bernardino	1,980	6,500	35 51	117 37	Wheeler.
Arnot Peak	Alpine	3,069	10,068	38 29	119 45	Do.
Ash Creek Butte	Nevada	2,508	8,222	41 26	122 3	U. S. G. S.
Awsala Point	Mariposa	2,110	6,920	37 45	119 32	Wheeler.
Bache Mountain (Loma Prieta)	Santa Clara	1,165	3,795	37 7	121 51	U. S. C. and G. S.
Bald Hill	Butte	1,820	5,973	39 57	121 29	U. S. G. S.
Bald Mountain	Shasta	1,709	5,607	40 55	121 28	Do.

\* This table was compiled for the Sierra Club by Mark H. Kerr, C. E. and R. H. Chapman, of the U. S. Geological Survey.

TABLE OF ELEVATIONS EXCEEDING 1,000 METERS (3,281 FEET) IN CALIFORNIA—Continued

Place	County	Elevation		Latitude	Longitude	Authority
		Meters	Feet			
Bald Mountain . . . . .	Plumas . . . . .	1,804	5,918	39 42	120 59	U S G S
Do . . . . .	Eldorado . . . . .	1,406	4,618	38 54	120 42	Do
Do . . . . .	Fresno . . . . .	2,419	7,986	36 41	119 00	Whitney
Bald Rock . . . . .	Butte . . . . .	1,006	3,301	39 38	121 20	U S G S
Bald Top . . . . .	Sierra . . . . .	1,791	5,878	39 34	120 57	Do
Bally Mountain . . . . .	Shasta . . . . .	1,904	6,246	40 34	122 38	Do
Banner Hill . . . . .	Nevada . . . . .	1,189	3,904	39 15	120 58	Do
Basket Dome . . . . .	Mariposa . . . . .	2,817	7,604	37 46	119 33	Wheeler
Bear Ranch Hill . . . . .	Plumas . . . . .	1,494	4,903	39 50	121 21	U S G S
Beatitude Mountain . . . . .	Mariposa . . . . .	2,015	6,611	37 42	119 41	Wheeler
Beckwith Butte . . . . .	Plumas . . . . .	2,209	7,248	39 46	120 26	U S G S
Bent Mountain . . . . .	do . . . . .	2,387	7,831	40 13	121 22	Wheeler
Bidwell Peak . . . . .	Modoc . . . . .	2,808	8,557	41 57	120 8	Do
Big Bar Hill . . . . .	Butte . . . . .	1,347	4,419	39 46	121 25	U S G S
Black Butte . . . . .	Lassen . . . . .	2,912	9,553	40 34	121 20	Wheeler
Black Crater . . . . .	Siskiyou . . . . .	2,636	8,650	41 31	122 7	U S G S
Black Fox Mountain . . . . .	do . . . . .	2,081	6,864	41 22	121 52	Do
Blue Mountain . . . . .	Modoc . . . . .	1,771	5,811	41 48	130 49	Do
Bogus Mountain . . . . .	Siskiyou . . . . .	1,408	4,622	41 50	122 22	Do
Bowman Mountain . . . . .	Nevada . . . . .	2,265	7,429	39 26	120 38	Do
Brewer Mountain . . . . .	Kern . . . . .	4,137	13,573	36 40	118 30	Whitney
Broderick Mountain . . . . .	Mariposa . . . . .	2,022	6,635	37 44	119 32	Wheeler
Browns Peak . . . . .	San Bernardino . . . . .	1,643	5,392	35 41	117 1	Do
Buckeye Peak . . . . .	Mono . . . . .	3,583	11,755	38 10	119 23	Do
Buckhorn Peak . . . . .	Mariposa . . . . .	1,156	3,794	37 40	120 7	U S G S
Buckingham Peak . . . . .	do . . . . .	1,409	4,622	37 35	119 53	Wheeler
Bullion Peak . . . . .	do . . . . .	1,284	4,215	37 33	120 4	U S G S
Bully Choop Mountain . . . . .	Shasta-Trinity . . . . .	2,156	7,073	40 32	122 45	Do
Burney Butte . . . . .	Shasta . . . . .	2,402	7,880	40 49	121 38	Do
Bust Rock . . . . .	Tuolumne . . . . .	2,791	9,157	38 12	119 47	Wheeler
Butte Mountain . . . . .	Plumas . . . . .	2,387	7,831	40 18	121 23	Do
Cahto Mountain . . . . .	Mendocino . . . . .	1,298	4,246	39 41	123 35	U S C and G S
Callahans Peak or Scott Mountain . . . . .	Siskiyou-Trinity . . . . .	2,377	7,800	41 10	122 40	U S G S
Cammal Peak . . . . .	Plumas . . . . .	1,756	5,760	39 43	121 6	Do
Canon Creek Peak or Scott Mountain <sup>a</sup> . . . . .	Trinity . . . . .	2,744	9,002	41 5	123 10	U S C and G S
Cap of Liberty . . . . .	Mariposa . . . . .	2,152	7,062	37 43	119 32	Wheeler
Carmel Mountain . . . . .	Monterey . . . . .	1,346	4,415	36 23	121 47	U S C and G S
Cary Peak . . . . .	Alpine . . . . .	2,652	8,700	38 47	119 50	U S G S
Cascade Cliff . . . . .	Mariposa . . . . .	2,468	8,084	37 43	119 29	Wheeler
		2,855	7,723			
Castac Lake . . . . .	Kern . . . . .	1,069	3,500	34 50	118 55	S C (Kerr)
Castle Mountain . . . . .	San Luis Obispo . . . . .	1,325	4,349	35 56	120 20	U S C and G S
Castle Rock . . . . .	Tuolumne . . . . .	3,009	9,872	38 15	119 50	Wheeler
Castle Peak . . . . .	Nevada . . . . .	2,786	9,139	39 22	120 21	U S G S
Do . . . . .	Tuolumne-Mono . . . . .	3,962	13,000	38 3	119 15	Whitney
Cedar Peak . . . . .	Modoc . . . . .	2,581	8,308	41 36	120 16	Wheeler
Chachelulla Mountain . . . . .	Trinity . . . . .	1,973	6,475	40 30	122 59	U S G S
Chelone Mountain . . . . .	San Benito . . . . .	1,158	3,800	36 28	121 5	Whitney
Chiquito Peak . . . . .	Madera . . . . .	2,517	8,267	37 21	119 25	Wheeler
Choual Mountain . . . . .	Santa Clara . . . . .	1,076	3,530	37 8	121 50	Whitney
Cinder Cone . . . . .	Lassen . . . . .	2,105	6,907	40 32	121 19	Wheeler
Cisco Butte . . . . .	Placer . . . . .	2,082	6,835	39 17	120 34	Do
Claremont Hill . . . . .	Plumas . . . . .	2,133	6,999	39 58	120 55	Do
Clermont Hill . . . . .	do . . . . .	2,137	7,014	39 58	120 57	U S G S
Clouds Rest . . . . .	Mariposa . . . . .	3,021	9,912	37 46	119 29	Wheeler
Cold Spring Hill . . . . .	Placer . . . . .	1,128	3,699	39 10	120 52	U S G S
Colorado Hill . . . . .	Alpine . . . . .	2,286	7,500	38 40	119 43	Do
Conejo Peak . . . . .	Ventura . . . . .	1,009	3,311	34 7	118 55	Wheeler
Conness Mountain . . . . .	Mono . . . . .	3,830	12,563	37 58	119 19	U S C and G S
Cooks Point . . . . .	Kern . . . . .	1,981	6,336	35 37	118 27	Wheeler
Corcoran (same as Sheep) . . . . .	Inyo . . . . .	4 208	14,059	36 34	118 9	Le Conte

<sup>a</sup> Approximate position.

TABLE OF ELEVATIONS EXCEEDING 1,000 METERS (3,281 FEET) IN CALIFORNIA—Continued.

Place.	County.	Elevation.		Latitude.	Longitude.	Authority.
		Meters.	Feet.			
Cose Peak .....	Inyo .....	2,568	8,425	36 12	117 46	Wheeler.
Cottonwood Peak .....	Tuolumne .....	2,327	7,633	37 55	119 44	Do.
Crater Peak .....	Shasta .....	2,059	8,724	40 42	121 35	U. S. G. S.
Crater (Rhett Lake) .....	Modoc .....	1,465	4,807	41 53	121 52	Do.
Crystal Peak .....	El Dorado .....	3,053	10,015	38 54	120 9	Do.
Do. ....	Sierra .....	2,569	8,428	39 28	120 3	Do.
Crossman Mountain .....	Amador .....	1,214	3,985	38 27	120 32	Do.
Cucamonga Peak .....	Los Angeles .....	2,599	8,529	34 12	117 35	Wheeler.
Dardanelle Cone .....	Tuolumne .....	2,907	9,538	38 23	119 53	U. S. G. S.
Deer Knob .....	El Dorado .....	1,718	5,635	38 54	120 26	Do.
Devil Peak .....	do .....	1,628	5,340	38 57	120 32	Do.
Do. ....	Placer .....	2,347	7,700	39 17	120 26	Do.
Do. ....	Mariposa .....	2,129	6,985	37 32	119 44	Wheeler.
Diablo Mountain .....	Contra Costa .....	1,173	3,849	37 53	121 55	U. S. C. and G. S.
Diamond Mountain .....	Lassen .....	2,337	7,667	40 13	120 38	Wheeler.
Disaster Peak .....	Alpine .....	3,075	10,085	38 27	119 42	Do.
Dome Mountain .....	Siskiyou .....	2,055	6,743	41 46	121 39	U. S. G. S.
Double Head .....	Modoc .....	1,687	5,537	41 46	121 3	Do.
Double Peak .....	Kern .....	2,513	8,263	35 1	118 29	Wheeler.
Duckwalls Mountain .....	Tuolumne .....	1,786	5,859	37 58	120 7	U. S. G. S.
Duncan Peak .....	Placer .....	2,118	7,177	39 3	120 30	Do.
Dyer Peak .....	Lassen-Plumas .....	2,246	7,369	40 15	121 1	Wheeler.
Eagle Lake .....	Lassen .....	1,553	5,115	40 35	120 45	Do.
Eagle Peak .....	Mariposa .....	2,362	7,751	37 44	119 37	Do.
Do. ....	Modoc .....	3,029	9,933	41 17	120 13	Do.
Do. ....	Tuolumne .....	2,586	8,484	38 18	119 52	Do.
Eagle Tower .....	Mariposa .....	2,133	7,162	37 45	119 36	Do.
Eddy Mountain .....	Siskiyou .....	2,790	9,151	41 19	122 30	U. S. G. S.
El Cajon Mountain .....	San Diego .....	1,122	3,680	32 55	116 49	Do.
El Capitan .....	Mariposa .....	2,137	7,012	37 44	119 38	Wheeler.
Elephants Back .....	Alpine .....	2,937	9,635	38 41	119 59	U. S. G. S.
Ellis Mountain .....	Placer .....	2,666	8,745	39 4	120 11	Do.
Elwett Mountain .....	Plumas .....	2,391	7,846	39 42	120 41	Do.
English Mountain .....	Nevada .....	2,561	8,404	39 27	120 33	Do.
Eureka Mountain .....	Plumas .....	2,233	7,490	39 45	120 43	Do.
Fall Creek Mountain .....	Nevada .....	2,296	7,532	39 24	120 38	Do.
Feather Lake .....	Lassen .....	1,855	6,085	40 33	121 16	Wheeler.
Fillmore Mountain .....	Sierra .....	2,332	7,816	39 43	120 51	U. S. G. S.
Findley Peak .....	Nevada .....	2,277	7,470	39 29	120 34	Do.
Fire Place Bluff .....	Mariposa .....	2,039	6,683	37 44	119 41	Wheeler.
Fish Valley Peak .....	Mono .....	3,275	10,749	38 25	119 37	Do.
Franklin Hill .....	Plumas .....	1,868	6,132	39 46	121 4	U. S. G. S.
Fredonyer Peak .....	Lassen .....	2,436	7,965	40 32	120 41	Do.
Freel Peak .....	El Dorado .....	3,319	10,900	38 51	119 54	Do.
Gavilan Peak .....	San Benito .....	1,030	3,381	36 45	121 30	Whitney.
Glacier Point .....	Mariposa .....	2,199	7,211	37 44	119 34	Wheeler.
Glass Mountain .....	Siskiyou .....	2,393	7,850	41 37	121 30	U. S. G. S.
Gleason Peak .....	Los Angeles .....	1,979	6,493	34 24	118 11	Wheeler.
Goddard Mountain .....	Fresno .....	4,124	13,528	37 6	118 50	Whitney.
Goose Lake .....	Modoc .....	1,430	4,697	41 50	120 25	Wheeler.
Goose Nest Mountain .....	Siskiyou .....	2,575	8,447	41 44	122 14	U. S. G. S.
Granite Dome .....	Tuolumne .....	3,162	10,373	38 12	119 45	Wheeler.
Grass Valley Hill .....	Plumas .....	1,837	6,196	39 45	120 59	U. S. G. S.
Grayback .....	Del Norte .....	1,777	5,830	41 59	123 31	U. S. C. and G. S.
Grizzly Hill .....	Plumas .....	1,958	6,424	39 50	121 11	U. S. G. S.
Grizzly Peak .....	Shasta .....	2,073	6,804	41 3	121 59	Do.
Do. ....	Plumas .....	2,343	7,687	39 52	120 32	Do.
Do. ....	Mariposa .....	1,892	6,207	37 43	119 33	Wheeler.
Do. ....	San Bernardino .....	3,573	11,723	34 10	116 50	Do.
Guide Peak .....	Placer .....	2,447	8,028	39 2	120 17	Do.
Half Dome .....	Mariposa .....	2,688	8,823	37 44	119 32	Do.
Hamilton Mountain .....	Santa Clara .....	1,233	4,209	37 20	121 39	U. S. C. and G. S.
Harkness Peak .....	Plumas .....	2,705	8,875	40 26	121 18	Wheeler.

TABLE OF ELEVATIONS EXCEEDING 1,000 METERS (3,281 FEET) IN CALIFORNIA—Continued

Place	County	Elevation		Latitude	Longitude	Authority
		Meters	Feet			
Haskells Peak . . . . .	Sierra . . . . .	2,477	8,126	39 40	120 33	Wheeler
Hat Peak . . . . .	Lassen . . . . .	2,338	7,676	41 4	120 5	Do
Hawkins Peak . . . . .	Alpine . . . . .	3,068	10,080	38 41	119 52	U. S. G. S.
Hayden Hill . . . . .	Lassen . . . . .	1,940	6,367	41 0	120 50	Do
Haystack Peak . . . . .	Tuolumne . . . . .	3,008	9,867	38 6	119 41	Wheeler.
Hepsidam . . . . .	San Benito . . . . .	1,352	4,438	36 19	120 49	U. S. C. and G. S.
Highland Peak . . . . .	Alpine . . . . .	3,339	10,955	38 33	119 45	U. S. G. S.
Hoffman Mountain . . . . .	Siskiyou . . . . .	2,444	8,018	41 37	121 32	Do
Do. . . . .	Tuolumne-Mariposa . . . . .	3,311	10,872	37 52	119 30	Whitney
Hoopah Mountain . . . . .	Humboldt . . . . .	1,234	4,050	41 5	123 47	U. S. C. and G. S.
Hot Springs Peak . . . . .	Lassen . . . . .	2,344	7,692	40 22	120 7	Wheeler
Houghs Peak . . . . .	Plumas . . . . .	2,210	7,251	40 3	120 53	U. S. G. S.
Hulls Mountain . . . . .	Mendocino . . . . .	2,107	6,914	39 31	122 57	U. S. C. and G. S.
Humboldt Mountain . . . . .	Humboldt . . . . .	1,013	3,325	40 59	123 58	Do
Iaqua Butte . . . . .	do . . . . .	1,091	3,580	40 40	123 52	Do.
Ingalls Mountain . . . . .	Plumas . . . . .	2,586	8,484	39 59	120 38	U. S. G. S.
Indian Rock . . . . .	Mariposa . . . . .	2,579	8,462	37 47	119 33	Wheeler
Iron Mountain . . . . .	Humboldt . . . . .	1,238	4,060	39 48	123 29	U. S. C. and G. S.
Jackson Mountain . . . . .	Plumas . . . . .	2,019	6,625	39 51	120 30	U. S. G. S.
Jackson Peak . . . . .	Nevada . . . . .	2,557	8,390	39 27	120 33	Wheeler
Jeff Davis Peak . . . . .	Alpine . . . . .	2,743	9,000	38 38	119 53	U. S. G. S.
Jobs Peak . . . . .	do . . . . .	3,231	10,600	38 51	119 52	Do.
Jobs Sister . . . . .	do . . . . .	3,299	10,820	38 51	119 53	Do
Jura Mountain . . . . .	Plumas . . . . .	1,920	6,300	40 1	120 48	Do.
Kai-al-au-wa Hill . . . . .	Mariposa . . . . .	2,734	8,989	37 46	119 39	Wheeler.
Kettle Rock . . . . .	Plumas . . . . .	2,392	7,849	40 8	120 11	U. S. G. S.
Key stone Mountain . . . . .	Sierra . . . . .	2,115	6,938	39 32	120 40	Do
King Peak . . . . .	Humboldt . . . . .	1,800	5,905	40 9	124 7	U. S. C. and G. S.
Kivet Mountain . . . . .	do . . . . .	1,274	4,180	41 14	123 46	Do
Lady Bug Peak . . . . .	Sierra . . . . .	2,548	8,361	39 29	120 3	U. S. G. S.
Larrabee Butte . . . . .	Humboldt . . . . .	1,225	4,020	40 25	123 42	U. S. C. and G. S.
Lassen Peak . . . . .	Shasta-Tehama-Plumas . . . . .	3,181	10,437	40 30	121 30	Wheeler.
Lassic Mountain . . . . .	Humboldt-Trinity . . . . .	1,794	5,885	40 20	123 33	U. S. C. and G. S.
Leaning Tower . . . . .	Mariposa . . . . .	1,777	5,830	37 43	119 38	Wheeler
Leavitt Peak . . . . .	Tuolumne . . . . .	3,522	11,553	38 16	119 41	Do.
Leek Spring Hill . . . . .	Eldorado . . . . .	2,329	7,640	38 37	120 17	U. S. G. S.
Leviathan Peak . . . . .	Alpine . . . . .	2,739	8,985	38 41	119 36	Do
Limestone Point . . . . .	Plumas . . . . .	1,771	5,811	39 51	120 54	Do
Lincoln Mountain . . . . .	Placer . . . . .	2,561	8,403	39 18	120 20	Do.
Linn Mountain . . . . .	Tehama . . . . .	2,623	8,604	40 1	122 47	Do.
Little Antelope Peak . . . . .	Mono . . . . .	2,803	9,192	38 20	119 37	Wheeler
Little Klamath Lake . . . . .	Siskiyou . . . . .	1,273	4,175	41 55	121 41	U. S. G. S.
Lola Mountain . . . . .	Nevada . . . . .	2,794	9,167	39 26	120 22	Do.
Loma Prieta (Mountain Bache). . . . .	Santa Clara . . . . .	1,156	3,793	37 7	121 51	U. S. C. and G. S.
Lone Star Hill . . . . .	Inyo . . . . .	1,497	4,911	36 13	117 26	Wheeler
Lookout Hill . . . . .	do . . . . .	1,284	4,214	36 14	117 26	Do.
Lookout Peak . . . . .	Alpine . . . . .	2,926	9,600	38 31	119 52	U. S. G. S.
Lovers' Leap . . . . .	Eldorado . . . . .	2,129	6,985	38 48	120 8	Do.
Lyell Mountain . . . . .	Fresno . . . . .	4,028	13,217	37	118 30	Whitney.
Maggies Peaks . . . . .	Eldorado . . . . .	2,659	8,725	38 56	120 7	U. S. G. S.
Magee Peak . . . . .	Shasta . . . . .	2,284	7,494	40 45	121 33	Do.
Malurango Peak . . . . .	Inyo . . . . .	2,696	8,844	36 6	117 30	Wheeler.
Markleville Peak . . . . .	Alpine . . . . .	2,885	9,465	38 39	119 54	U. S. G. S.
McDonald Peak . . . . .	Lassen . . . . .	2,424	7,954	40 56	120 25	Wheeler
McGill Peak . . . . .	Ventura . . . . .	2,808	9,214	34 48	119 8	Do.
McKessick Peak . . . . .	Lassen . . . . .	2,159	7,088	40 10	120 15	Do
McKinstry Peak . . . . .	Placer-Eldorado . . . . .	2,413	7,918	39 2	120 21	U. S. G. S.
Mocho Mountain . . . . .	Alameda . . . . .	1,245	4,085	37 29	121 38	U. S. C. and G. S.
Mokelumne Peak . . . . .	Amador . . . . .	2,856	9,371	38 32	120 6	U. S. G. S.
Mono Pass . . . . .	Mono . . . . .	3,281	10,765	37 51	119 11	Whitney.
Moore Hill . . . . .	Mariposa . . . . .	1,398	4,588	37 26	120 1	Wheeler.
Needle Peak . . . . .	Inyo . . . . .	2,180	7,186	35 55	117 7	Do.



# CONTROLLING FACTORS.

21

TABLE OF ELEVATIONS EXCEEDING 1,000 METERS (3,281 FEET) IN CALIFORNIA—Continued.

Place.	County.	Elevation.		Latitude.	Longitude.	Authority.
		Meters.	Feet.			
Nichols Point.....	Kern.....	1,900	6,233	35 37	118 18	Wheeler.
Nipple.....	Alpine.....	2,862	9,390	38 39	119 56	U. S. G. S.
Noble Pass.....	Shasta.....	1,818	5,963	40 34	121 36	Wheeler.
North Dome.....	Mariposa.....	2,294	7,525	37 45	119 34	Do.
North Peak (Diablo).....	Santa Clara.....	1,095	3,593	37 24	121 53	Whitney.
Observation Peak.....	Lassen.....	2,441	8,009	40 46	120 10	Wheeler.
Olcott Peak.....	San Bernardino.....	2,248	7,374	35 59	115 24	Do.
Old Baldy, or San Antonio Peak.....	Los Angeles.....	3,085	10,120	34 16	117 39	Do.
Old Man Mountain.....	Sierra.....	2,877	7,800	39 22	120 31	U. S. G. S.
Omjumnin Peak.....	Plumas.....	2,528	8,293	39 56	120 16	Wheeler.
Ophir Mountain.....	Inyo.....	1,848	6,063	36 17	117 36	Do.
Oso Mountain.....	Stanislaus.....	1,031	3,383	37 30	121 21	Whitney.
Ostrander's Rocks.....	Mariposa.....	2,482	8,142	37 41	119 36	Wheeler.
		2,486	8,157			
Pah-ute Peak.....	Inyo.....	2,543	8,344	35 29	119 22	Do.
Paxton.....	Mendocino.....	1,041	3,414	39 8	123 19	U. S. C. and G. S.
Penmen Peak.....	Plumas.....	2,219	7,280	39 49	120 36	U. S. G. S.
Pierce Mountain.....	Humboldt.....	999	3,278	40 25	124 8	U. S. C. and G. S.
Pike Co. Peak.....	Yuba.....	1,120	3,675	39 28	121 12	U. S. G. S.
Pilot Hill.....	Plumas.....	1,880	6,193	39 45	120 30	Do.
Pilot Knob.....	San Bernardino.....	1,084	3,525	35 23	117 14	Wheeler.
Pilot Peak.....	Plumas-Sierra.....	2,280	7,509	39 47	120 52	U. S. G. S.
Do.....	Mariposa.....	1,836	6,024	37 45	119 56	Wheeler.
Pinto Peak.....	Inyo.....	2,215	7,265	36 26	117 20	Do.
Preston Peak.....	Del Norte.....	2,142	7,028	41 45	123 33	U. S. C. and G. S.
Profile Cliff.....	Mariposa.....	2,262	7,425	37 43	119 36	Wheeler.
Promontory Point.....	Tehama.....	1,105	3,627	39 59	121 44	U. S. G. S.
Pyramid Peak.....	Eldorado.....	3,054	10,020	38 50	120 10	Do.
	Inyo.....	2,059	6,754	36 23	116 37	
Rainbow Mountain.....	Humboldt.....	1,046	3,432	40 25	124 10	U. S. C. and G. S.
Rattlesnake Butte.....	Modoc.....	1,516	4,973	41 27	120 45	U. S. G. S.
Raymond Peak.....	Alpine.....	3,072	10,075	38 35	119 50	Do.
Red Lake Peak.....	Eldorado.....	3,033	9,950	38 43	119 59	Do.
Red Mountain (Signal Peak).....	Placer.....	2,396	7,860	39 15	120 32	U. S. C. and G. S.
Red Peak.....	Eldorado.....	2,119	6,952	39	120 21	U. S. G. S.
Relief Peak.....	Tuolumne.....	3,300	10,826	38 14	119 44	Wheeler.
Rhett (or Tule) Lake.....	Siskiyou.....	1,263	4,143	41 53	121 30	U. S. G. S.
Richardson's Peak.....	Eldorado.....	3,021	9,910	38 53	120 9	Do.
Richardson.....	Tuolumne.....	2,985	9,794	38 5	119 41	Wheeler.
Rickey's Peak.....	Mono.....	3,043	9,983	38 15	119 23	Do.
Robb's Peak.....	Eldorado.....	2,050	6,725	38 56	120 24	U. S. G. S.
Rocky Butte.....	San Luis Obispo.....	1,055	3,462	35 40	121 4	U. S. C. and G. S.
Round Mountain.....	Shasta.....	1,048	3,439	40 46	121 58	U. S. G. S.
Round Top or Alpine Peak.....	Amador.....	3,179	10,430	38 39	120	Do.
Rubicon Peak.....	Eldorado.....	2,302	7,538	38 59	120 8	Do.
Saddle Back Mountain.....	Sierra.....	2,000	6,760	39 38	120 51	Do.
Saddle Mountain.....	Eldorado.....	1,599	5,245	38 51	120 35	Do.
St. Helena Mountain.....	Sonoma-Lake.....	1,322	4,337	38 40	122 38	U. S. C. and G. S.
San Antonio Peak.....	Los Angeles.....	3,085	10,120	34 17	117 39	Wheeler.
San Bernardino Peak.....	San Bernardino.....	3,078	10,100	34 11	117 56	Do.
San Carlos Peak.....	San Benito.....	1,517	4,977	36 26	120 39	Whitney.
San Fernando Peak.....	Los Angeles.....	1,156	3,793	34 20	118 36	Wheeler.
San Gabriel Peak.....	do.....	1,900	6,232	34 15	118 6	Do.
San Jose Mountain.....	San Luis Obispo.....	1,151	3,777	35 19	120 16	U. S. C. and G. S.
Santa Alla.....	San Benito.....	1,101	3,613	36 54	121 14	Do.
Santa Lucia.....	Monterey.....	1,788	5,867	36 9	121 25	Do.
Sand Mountain.....	Eldorado.....	1,464	4,802	38 52	120 40	U. S. G. S.
Sanhedrin.....	Mendocino.....	1,890	6,199	39 31	123 6	U. S. C. and G. S.
Sauel Mountain.....	do.....	1,026	3,365	38 57	123 13	Do.
Saw Mill Peak.....	Butte.....	1,021	3,351	39 49	121 38	U. S. G. S.

TABLE OF ELEVATIONS EXCEEDING 1,000 METERS (3,281 FEET) IN CALIFORNIA—Continued

Place	County	Elevation		Latitude	Longitude	Authority
		Meters	Feet			
Scott Mountain or Callahan's Peak . . . . .	Siskiyou-Trinity . . . . .	2,377	7,800	41 10	122 40	U S G S
Scott Mountain or Cannon Creek Peak . . . . .	Trinity . . . . .	2,744	9,202	41 5	123 10	U S C and G S
Sentinel Dome . . . . .	Mariposa . . . . .	2,476	8,122	37 43	119 35	Wheeler
Sentinel Peak . . . . .	Inyo . . . . .	3,004	9,856	36 6	117 5	Do
Shaffer Peak . . . . .	Lassen . . . . .	2,092	6,864	40 27	120 21	Do
Shasta Mountain <sup>a</sup> . . . . .	Siskiyou . . . . .	4,363	14,350	41 25	122 12	U S G S
		4,402	14,444			Whitney
Sheep Mountain <sup>b</sup> . . . . .	Inyo . . . . .	4,285	14,059	36 34	118 9	Le Conte
Shinn's Peak . . . . .	Lassen . . . . .	2,325	7,623	40 41	120 14	Wheeler
Sierra Butte . . . . .	Sierra . . . . .	2,626	8,615	39 36	120 39	U S G S
Signal Peak (Red Mountain) . . . . .	Nevada . . . . .	2,396	7,860	39 20	120 31	Do
Silliman Mountain . . . . .	Tulare . . . . .	3,543	11,623	36 50	118 20	Whitney
Silver Knob . . . . .	Mariposa-Madera . . . . .	1,580	5,183	37 26	119 45	Wheeler
Silver Peak . . . . .	Alpine . . . . .	3,333	10,935	38 33	119 45	U S G S
Slate Mountain . . . . .	Eldorado . . . . .	1,193	3,915	38 49	120 41	Do
Slate Peaks . . . . .	Mono . . . . .	4,084	13,400	37 31	118 56	Whitney
Slick Rock . . . . .	Eldorado . . . . .	2,220	7,285	38 53	120 17	U S G S
Snow Mountain . . . . .	Placer . . . . .	2,453	8,048	39 15	120 28	Do
Snow Mountain, east . . . . .	Glenn . . . . .	2,134	7,000	39 23	122 45	U S C and G S.
Sonora Pass . . . . .	Tuolumne . . . . .	2,933	9,623	38 15	119 45	U S G S
Sonora Peak . . . . .	Mono . . . . .	3,499	11,479	38 21	119 38	Wheeler
South Fork Peak . . . . .	Lassen . . . . .	2,257	7,406	41 9	120 33	U S G S
Spanish Bluff . . . . .	Plumas . . . . .	2,148	7,047	39 56	121 8	Do
Spanish Peak . . . . .	do . . . . .	2,204	7,231	39 56	121 14	Do
Spruce Grove Mountain . . . . .	Humboldt . . . . .	1,161	3,810	40 6	123 41	U S C and G S
Squaw Peak . . . . .	Placer . . . . .	2,731	8,960	39 11	120 16	U S G S
Stanislaus Peak . . . . .	Alpine . . . . .	3,390	11,123	38 23	119 40	Wheeler
Starr King Mountain . . . . .	Mariposa . . . . .	2,768	9,080	37 42	119 31	Do
Stevens Peak . . . . .	Eldorado . . . . .	3,079	10,100	38 44	119 59	U S G S
Strawberry Peak . . . . .	San Bernardino . . . . .	1,833	6,014	34 14	117 15	Wheeler
Sugar Loaf . . . . .	Kern . . . . .	1,110	3,643	35 37	118 46	Do
Do . . . . .	Placer . . . . .	1,158	3,799	39 2	120 44	U S G S
Do . . . . .	Siskiyou . . . . .	1,905	6,250	41 21	122 20	Do
Sulphur Peak . . . . .	Sonoma . . . . .	1,055	3,462	38 46	122 51	U S C and G S
Summit Peak . . . . .	Lassen . . . . .	2,533	8,311	39 42	120 8	Wheeler
Sunset Hill . . . . .	Butte . . . . .	1,009	3,309	39 31	121 18	U S G S
Sweetwater Peak . . . . .	Mono . . . . .	3,589	11,778	38 26	119 18	Wheeler
Table Mountain . . . . .	Butte . . . . .	1,895	6,217	39 58	121 25	U S G S
Do . . . . .	Sierra . . . . .	1,717	5,619	39 31	120 51	Do
Table Rock . . . . .	Siskiyou . . . . .	1,169	3,836	41 44	122 17	Do
Table Rocks . . . . .	Sierra . . . . .	2,128	6,980	39 42	120 53	Do
Tahoe Lake <sup>c</sup> . . . . .	Placer-Eldorado . . . . .	1,897	6,225	39 00	120 00	Do
Tallac Mountain . . . . .	Eldorado . . . . .	2,982	9,785	38 54	120 6	Do
Taylor Rock . . . . .	Plumas . . . . .	2,239	7,345	40 00	120 49	Do
Tehachapi Peak . . . . .	Kern . . . . .	2,456	8,056	35 2	118 35	Wheeler
Tejon Pass <sup>d</sup> . . . . .	San Luis Obispo . . . . .	1,611	5,285	35 00	119 30	Whitney
Tejon Pass (old fort) . . . . .	Kern . . . . .	1,143	3,750	34 55	118 55	S C. (Kerr)
Telescope Peak . . . . .	Inyo . . . . .	3,333	10,935	36 10	117 05	Wheeler
Tells Peak . . . . .	Eldorado . . . . .	2,781	9,125	38 57	120 15	U S G S
Texas Hill . . . . .	Mariposa . . . . .	1,011	3,313	37 40	120 00	Do
Thimble Peak . . . . .	Eldorado . . . . .	3,008	9,870	38 40	120 4	Do
Thompson Peak . . . . .	Plumas . . . . .	2,363	7,752	40 15	120 33	Wheeler
Thompson Peak <sup>e</sup> . . . . .	Trinity . . . . .	2,743	9,000	41 1	123 1	U S G S
Timber Mountain . . . . .	Modoc . . . . .	1,567	5,142	41 37	120 45	Do
Timbered Mountain . . . . .	do . . . . .	1,678	5,505	41 45	120 45	Do
Tinker Knob . . . . .	Placer . . . . .	2,749	9,020	39 15	120 18	Do
Toms Head . . . . .	Tehama . . . . .	2,065	6,775	40 5	122 47	Do
Toorup Mountain . . . . .	Del Norte . . . . .	1,239	4,065	41 30	123 56	U S C and G S

<sup>a</sup> A series of barometer observations placed Mount Shasta 14,511 feet (4,423 meters), but results above are more reliable

<sup>b</sup> Sheep Mountain, also called Whitney No 1 and Mount Corcoran.

<sup>c</sup> Portion of Lake Tahoe is in Nevada

<sup>d</sup> A high ridge in Kern County near Tehachapi Peak is erroneously called Tejon Pass

<sup>e</sup> Sometimes called Stewart's Fork Peak

TABLE OF ELEVATIONS EXCEEDING 1,000 METERS (3,281 FEET) IN CALIFORNIA—Continued.

Place.	County.	Elevation.		Latitude.	Longitude.	Authority.
		Meters.	Feet.			
Toro Mountain .....	Monterey .....	1,083	3,554	36 31	121 37	U. S. C. and G. S.
Tower Peak .....	Tuolumne-Mono .....	3,546	11,634	38 9	119 31	Wheeler.
Tower Rock .....	Plumas .....	2,376	7,794	40 00	120 47	U. S. G. S.
Tuolumne Peak .....	Tuolumne-Mariposa .....	2,056	6,747	37 52	119 29	Wheeler.
Turret Peak .....	Modoc .....	1,920	6,299	41 23	121 7	U. S. G. S.
Twin Peaks .....	Placer .....	2,720	8,924	39 7	120 14	Do.
Do .....	Monterey .....	1,580	5,020			
		1,433	4,700	36 3	121 29	U. S. C. and G. S.
Tyndall Mountain .....	Tulare .....	4,279	14,038	36 39	118 10	LeConte.
Umanhum Mountain .....	Santa Clara .....	1,046	3,430	37 10	121 53	Do.
Union Point .....	Mariposa .....	1,917	6,290	37 44	119 35	Wheeler.
Wamelo Rock .....	Madera .....	2,268	7,440	37 27	119 31	Do.
Wards Peak .....	Placer .....	2,641	8,665	39 9	120 15	U. S. G. S.
Warren Peak .....	Modoc .....	2,947	9,668	41 22	120 13	Wheeler.
Washington Tower .....	Mariposa .....	1,785	5,856	37 44	119 34	Do.
Watkins Mountain .....	do .....	2,499	8,200	37 46	119 31	Do.
Webber Peak .....	Sierra .....	2,470	8,102	39 28	120 26	U. S. G. S.
Wellington Peak .....	Plumas .....	2,336	7,665	39 51	120 31	Wheeler.
Whitney Mountain <sup>a</sup> .....	Inyo .....	4,426	14,522	36 35	118 20	Langley.
	Tulare .....	4,410	14,470	36 35	118 20	Wheeler.
White Granite Peak .....	Ventura .....	2,155	7,069	34 36	119 3	Do.
White Mountains:						
Mount McBride .....	Mono .....	4,090	13,415	37 38	118 15	U. S. C. and G. S.
South Peak .....	do .....	4,850	14,245	37 38	118 15	Do.
Wilson <sup>b</sup> .....	Los Angeles .....	1,814	5,950	34 13	118 5	Do.

<sup>a</sup> This is the peak formerly known as Fisherman's.<sup>b</sup> Approximate elevation.—Prof. E. C. Pickering.

SUPPLEMENTARY TABLE OF ELEVATIONS DETERMINED BY JOSEPH N. LE CONTE, JULY AND AUGUST, 1903.

Place.	Feet.	Place.	Feet.	Place.	Feet.
Williamson .....	14,396	Split .....	14,076	Middle Palisade .....	14,000
Sill .....	14,128	Keith .....	14,015	Jordan .....	14,212
Humphreys .....	13,985	Tyndall .....	14,038	Darwin .....	13,784
Junction .....	13,916	Goddard .....	13,582	Stanford .....	13,988
Crag Ericson .....	13,629	Goat Mountain .....	12,206	North Guard .....	13,352
Brewer .....	13,573	Peak south of Brewer .....	13,576	Table .....	13,625
High peak south of table .....	13,679	Milestone .....	13,655	No. 1 Kaweah .....	13,777
No. 2 Kaweah .....	13,825	No. 3 Kaweah .....	13,872	Mount Kaweah .....	13,822
Red Spur .....	12,736	Saw Tooth .....	12,345	Guyot .....	12,381
Peak head of Rock Creek .....	13,416	Cirque Peak .....	12,942	Olancho .....	12,133
Sheep Mountain .....	14,059	Le Conte .....	13,983	Lone Pine Peak .....	12,925
White Mountain Peak .....	14,273	Railroad Station .....	3,727	Pinchot .....	13,485
University .....	13,608	Arrow Peak .....	12,948	King .....	12,875
Gardner .....	12,928	Barnard .....	13,525	East Vidette .....	12,684
Bradley .....	13,334	Rixford .....	12,906	Gould .....	13,080
High peak on Wood's Creek .....	13,127	Pyramid Peak .....	13,767	Striped .....	13,178
Ruskin .....	12,775	Table Palisades .....	13,504	Peak Marion .....	12,704
Dougherty Peak .....	12,602	Agassiz Needle .....	13,747	Dusy Peak .....	13,875
Flat peak on head Middle Fork .....	13,520	Devil's Crag .....	12,595	Woodworth .....	12,240
Charybdis .....	13,088	Scylla .....	12,948	Blue Canyon Peak .....	12,425
Kettle Rock .....	9,587	Peak at junction of Kings .....	9,439	Mount Sillman Cliff .....	11,229
South Dome Peak .....	11,876	Avalanche Peak .....	11,285	Cross Mountain .....	12,955
Geneva .....	13,049	Harrison Pass .....	12,720	Sphinx (head of) .....	9,103
Sphinx (top of) .....	9,180	Palmer .....	10,123	Tehiptee Dome .....	7,760



# CLIMATE OF NORTH AND CENTRAL COAST.

## CLIMATOLOGY OF EUREKA, AND WEATHER CONDITIONS ALONG THE COAST OF NORTHERN CALIFORNIA.

By Mr. A. H. BELL, Observer, Weather Bureau.

The city of Eureka stands on the south shore of Humboldt Bay about 7 miles from the entrance and some 215 miles from San Francisco, latitude north  $40^{\circ} 48'$  and longitude west  $124^{\circ} 11'$ . A few miles east of the city we have the forest-covered foothills of the coast range, while on the west the shore is washed by the Pacific Ocean.

Equable and apparently health-giving is Eureka's climate. Since establishment of the station the highest recorded temperature is  $84^{\circ}$  and the lowest  $20^{\circ}$  above. Fogs and overcast skies prevail at all seasons along the coast. They preserve a uniform temperature and a humid atmosphere, and, to a large extent, determine the character of our industries and productions. In summer, however, cloudless skies and a high temperature are characteristics of the higher latitudes and of the region east of the redwood belt. From October until April is the rainy season, but the wet period is by no means a season of continuous precipitation. Sometimes a rainy season will embrace much pleasant weather. While the prevailing winds are in summer northerly, seldom indeed do they attain the velocity of a gale, usually rising before noon and subsiding before nightfall. These winds are extremely liable to ensue on two or three consecutive days. In winter, on the other hand, the prevailing winds are southeasterly.

Humboldt Bay has a varying width of from half a mile to 4 miles and a length of 14 miles, and possesses a tidal area of about 28 square miles. It lies nearly parallel with the coast, and between it and the ocean there intervenes a sand peninsula with a width of from one-fourth mile to  $1\frac{1}{2}$  miles. So narrow is the entrance and so peculiar are its relations to the body of water within—in other words so completely landlocked is our harbor—that tempestuous weather outside affects it very little.

### MEAN MONTHLY AND ANNUAL TEMPERATURE (DEGREES FAHRENHEIT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1887.....	46.6	41.0	49.8	48.5	51.9	52.4	52.5	54.7	54.0	53.0	50.5	47.7	50.2
1888.....	44.6	48.4	47.7	50.9	53.5	59.4	58.0	57.4	57.4	54.6	51.2	52.2	52.9
1889.....	46.9	48.2	52.2	53.2	54.8	55.0	55.6	55.4	56.0	56.2	53.2	46.6	52.8
1890.....	42.2	44.4	46.9	49.0	54.0	55.2	56.7	55.8	53.2	51.6	50.0	48.4	50.6
1891.....	48.0	45.4	49.0	50.9	53.2	56.4	56.0	59.4	56.7	54.1	52.4	45.4	52.2
1892.....	48.0	47.8	48.6	49.0	52.8	53.6	55.4	56.2	56.2	53.6	49.6	46.6	51.4
1893.....	44.7	46.2	47.8	47.8	51.4	53.7	55.9	56.2	56.0	51.4	50.9	47.4	50.6
1894.....	45.6	43.6	46.4	48.6	51.0	54.4	54.4	57.8	56.0	53.9	50.7	46.0	50.7
1895.....	46.4	49.4	47.9	49.8	53.0	52.8	56.0	54.0	53.7	52.0	48.8	46.8	50.9
1896.....	50.0	48.4	50.0	48.3	51.5	54.0	57.2	59.9	55.6	52.6	49.1	51.0	52.3
1897.....	48.1	47.2	45.2	51.0	52.8	55.8	55.8	56.5	55.2	53.8	49.4	48.6	51.6
1898.....	44.0	50.0	45.6	48.8	50.4	56.3	54.6	55.9	56.0	53.9	48.3	46.2	50.8
1899.....	47.5	44.4	48.0	48.2	49.6	52.0	54.8	55.9	54.8	52.0	55.9	48.0	50.9
1900.....	50.4	48.6	50.5	50.5	54.4	56.2	56.4	57.0	56.6	53.8	53.8	50.8	53.2
Mean.....	46.6	46.6	48.2	49.6	52.4	54.8	55.7	56.5	55.5	53.3	51.0	48.0	51.5

CLIMATOLOGY OF CALIFORNIA.

SUMMARY OF MONTHLY MEANS AND EXTREMES OF TEMPERATURE.

Month.	Highest monthly mean		Lowest monthly mean		Absolute maximum		Absolute minimum		Greatest daily range	Mean daily range	Mean variability
	Date	Temperature	Date	Temperature	Date	Temperature	Date	Temperature			
January .....	1900	50 4	1890	42 2	26, 1888	77 0	14, 1888	20 0	25 0	12 2	3 1
February .....	1898	50 0	1887	41 0	2, 1898	70 0	4, 1899	24 0	29 0	12 7	2 5
March .....	1889	52 2	1897	45 2	26, 1895	75 0	3, 1896	29 0	24 0	12 0	2 4
April .....	1889	53 2	1893	47 8	26, 1891	73 0	5, 1895	31 0	25 0	11 3	2 4
May .....	1889	54 8	1899	49 6	24, 1890	78 0	1, 1887	35 0	26 0	10 0	1 9
June .....	1888	59 4	1899	52 0	17, 1898	75 0	26, 1887	40 0	18 0	10 0	1 6
July .....	1888	58 0	1887	52 5	16, 1888	73 0	15, 1887	43 0	14 0	9 0	1 3
August .....	1896	59 9	1895	54 0	27, 1894	79 0	31, 1890	45 0	18 0	9 0	1 6
September .....	1888	57 4	1890	53 2	17, 1897	82 0	22, 1895	36 0	22 0	11 2	2 2
October .....	1889	56 2	1893	51 4	5, 1897	84 0	17, 1893	39 0	34 0	12 2	2 5
November .....	1889	53 2	1898	48 3	16, 1895	74 0	27, 1896	27 0	26 0	12 6	2 9
December .....	1888	52 2	1891	45 4	15, 1891	70 0	22, 1895	30 0	24 0	12 6	2 8
Annual. ....	1896	59 9	1887	41 0	a 1897	84 0	b 1888	20 0	34 0	11 2	2 3

a October 5

b January 14

WEATHER

Month	Average number of days				Month	Average number of days			
	Clear	Partly cloudy	Cloudy	Rainy		Clear	Partly cloudy	Cloudy	Rainy
January .....	6	10	15	17	August .....	7	13	11	2
February .....	6	10	13	15	September .....	9	12	9	5
March .....	6	11	14	16	October .....	9	11	11	10
April .....	6	11	12	13	November .....	8	10	12	13
May .....	7	12	12	11	December .....	7	9	15	16
June .....	8	13	8	7	Annual .....	88	135	142	126
July .....	9	13	10	1					

MONTHLY, ANNUAL, AND SEASONAL PRECIPITATION (INCHES AND HUNDREDTHS)

[The capital letter "T" indicates the rainfall was but a trace and was too small to measure The total rainfall for the seasons are the totals from July 1 of one year to June 30 of the next year ]

Year	Jan	Feb	Mar.	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Season of—	Seasonal.	Annual
1887 .....	8 86	9 07	2 28	5 55	3 51	1.92	0 06	0 07	0 21	0 55	2 66	5 43	.....	.....	40 17
1888 .....	12 95	1 98	4 09	1 05	0 76	4 66	0 44	T	0 06	1.15	3 41	5 93	1887-88	34 78	36 48
1889 .....	4 25	1 93	5 91	3 49	7 20	0 37	0 15	0 13	0 32	8 36	3 71	12 33	1888-89	33 98	48 70
1890 .....	18 26	13 88	11 57	2 26	1 71	0 87	0 08	0 02	0 79	0 44	0 18	5 48	1889-90	73.92	55 54
1891 .....	3 33	9 81	5 83	6 37	1 55	1 53	0 29	0 31	1 45	1 64	2 72	10 97	1890-91	35 91	45 80
1892 .....	3 29	2.53	5 32	5 54	3 63	0 45	0 00	0 09	0 99	2 90	8 19	6 55	1891-92	37.63	39 48
1893 .....	3 65	6 27	10 59	7.16	2 43	0 33	0 00	0 00	2 39	4 33	9 87	6 69	1892-93	49 06	53 71
1894 .....	12 33	6 13	7 46	2 97	1 31	1 67	0 02	0 04	1 34	3 12	2 08	12 31	1893-94	55 26	51 28
1895 .....	9 37	3 60	5 31	2 88	5 39	0 06	0 23	0 11	3 14	0 05	3 88	7 50	1894-95	46 25	41 52
1896 .....	3 14	4 61	6 93	11 13	6.22	0 61	0 00	0 70	1 60	2 37	8 00	9 41	1895-96	52 81	59 62
1897 .....	3.04	11 23	9 85	2 55	0 75	1 60	0 03	0 15	1 05	2 63	5 44	6 18	1896-97	50 58	44 50
1898 .....	3 23	8 00	1 80	2 78	2 62	1 21	T.	0 06	1 48	2 13	4 43	3 17	1897-98	35 00	30 91
1899 .....	6.50	5 03	8 53	1 91	1 73	0 75	0 00	0 42	0 88	4 23	14 80	7 05	1898-99	36 08	51 88
1900 .....	6 63	6 04	3 42	4 43	2 08	1 70	T	0 07	0 21	7 07	8.06	5 27	1899-1900	51.33	44 98
Average for 14 years .....	7 42	6 44	6.85	4 29	2 92	1 26	0 09	0 16	1 17	2.92	5 53	7 49	.....	45 59	46 04

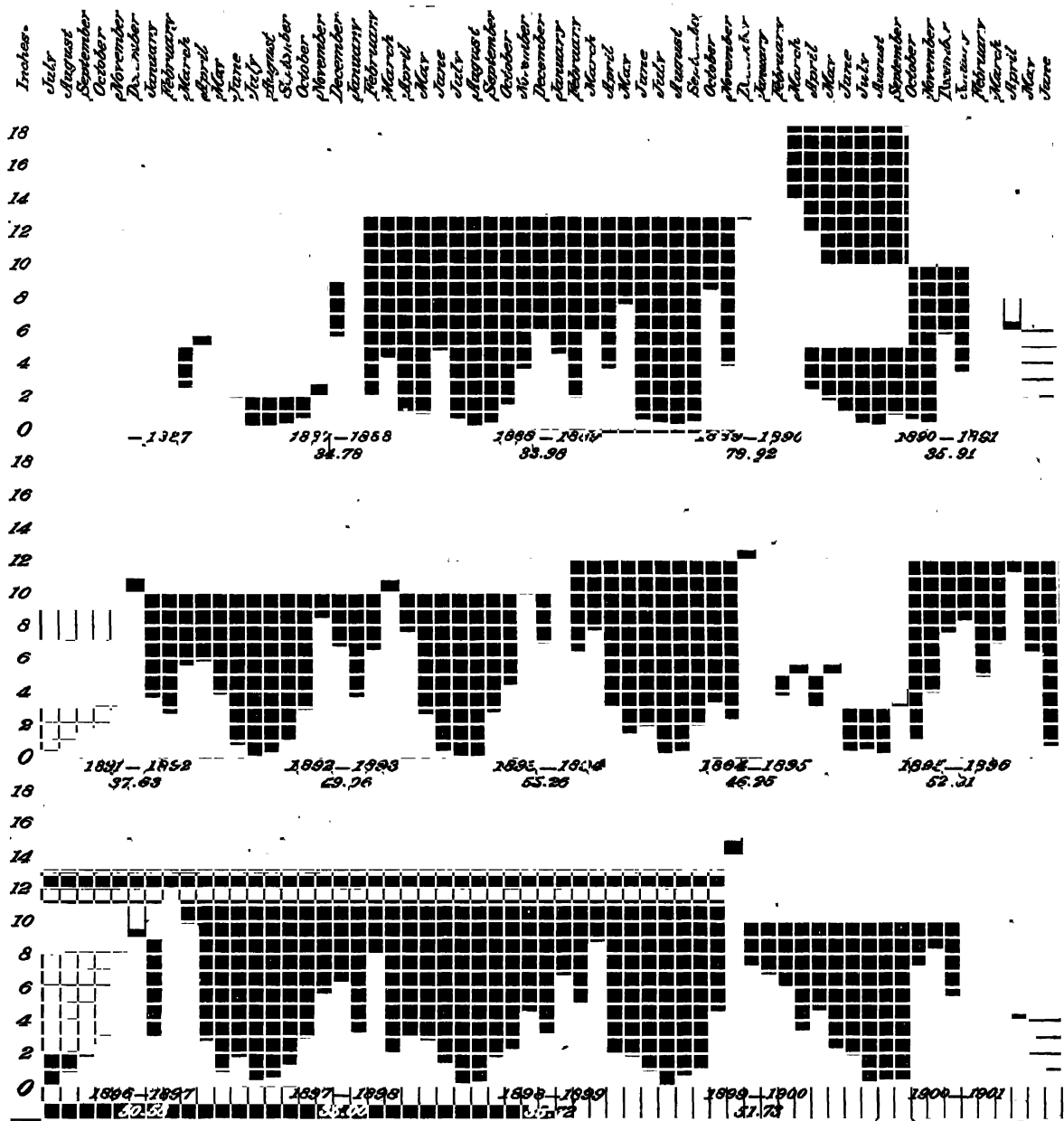


FIG. 4.—Seasonal rainfall at Eureka, Cal., from 1887 to 1901.

CLIMATOLOGY OF CALIFORNIA.

DATES OF FIRST AND LAST LIGHT AND KILLING FROSTS, WITH LOWEST TEMPERATURE

[Record began January 1, 1887]

Year.	First light frost of season		First killing frost of season		Last light frost of season		Last killing frost of season	
	Date	Minimum temperature	Date	Minimum temperature	Date	Minimum temperature	Date	Minimum temperature
		° F		° F		° F		° F
1887-88.....					May 11, 1888	44	Mar. 27, 1888	38
1888-89.....	Nov 4, 1888	38	Nov 27, 1888	35	Mar 21, 1889	39	Feb 19, 1889	34
1889-90.....	Sept 13, 1889	40	Dec 11, 1889	34	Apr 14, 1890	35	Mar 11, 1890	31
1890-91.....	Oct 3, 1890	40	Nov 7, 1890	35	Apr 11, 1891	40	Mar 29, 1891	34
1891-92.....	Sept 30, 1891	43	Dec 5, 1891	34	Apr 26, 1892	38	Apr 4, 1892	36
1892-93.....	Oct 17, 1892	40	Nov 17, 1892	37	Apr. 18, 1893	36	Apr. 8, 1893	33
1893-94.....	Oct 17, 1893	38	Nov 17, 1893	35	May 16, 1894	36	Mar 22, 1894	36
1894-95.....	Nov 13, 1894	46	Dec 10, 1894	36	Apr 18, 1895	38	Apr 5, 1895	31
1895-96.....	Aug 8, 1895	46	Nov 23, 1895	32	May 12, 1896	38	Mar 31, 1896	31
1896-97.....	Sept 13, 1896	43	Nov 27, 1896	27	Apr. 7, 1897	36	Mar 30, 1897	32
1897-98.....	Oct 15, 1897	39	Dec 19, 1897	32	May 7, 1898	39	Mar 22, 1898	30
1898-99.....	Oct 24, 1898	41	Nov 25, 1898	34	June 6, 1899	40	Feb 7, 1899	33
1899-1900.....	Oct 14, 1899	39	Dec 13, 1899	35	May 27, 1900	43	None . . . . .	
1900-1901.....	Oct 6, 1900	43	None . . . . .		June 12, 1901	42	April 7, 1901	34

In the table below will be found the greatest monthly precipitation and date; least monthly precipitation and date; number of times monthly precipitation has exceeded the normal in fourteen years:

Month	Greatest monthly precipitation		Least monthly precipitation.		Number of times precipitation has exceeded normal in 14 years			Month	Greatest monthly precipitation.		Least monthly precipitation		Number of times precipitation has exceeded normal in 14 years		
	Amount	Date	Amount	Date	In first 7 years	In second 7 years	Total.		Amount	Date	Amount	Date	In first 7 years	In second 7 years	Total
	In		In		In.	In	In		In		In		In.	In	In
January .....	18 26	1890	3 04	1897	3	3	6								
February...	13 88	1890	1 93	1889	4	2	6	July . .	0 44	1888	0 00	{ 1892 1893 1896 }	3	1	4
March . . .	11 37	1890	1 80	1898	2	4	6								
April .....	11.13	1896	1 05	1888	4	2	6	August .	0 70	1896	0 00	1893	2	4	6
May .....	7 20	1889	0 75	1897	3	2	5	September .	3.14	1895	0 06	1888	2	4	6
June.....	4 66	1888	0 06	1895	3	2	5	October	8 36	1889	0 05	1895	3	4	7
								November .	9 37	1893	0 18	1890	2	5	7
								December ..	12 68	1889	3 17	1898	2	2	4

AVERAGE HOURLY WIND VELOCITY [IN MILES PER HOUR].

[Record began January 1, 1888]

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov.	Dec
1888.....	6 8	6 0	9 4	5 9	6 7	6 3	7 3	4 6	4 8	4 3	3 9	5 1
1889.....	5 1	4 8	6 3	7 5	7 9	6 4	5 3	5 1	5 2	4 6	4 1	5 7
1890.....	7 7	7 5	6 3	8 3	7 8	8 6	6 9	5 3	3 9	5 1	4 0	4 5
1891.....	5 0	7 0	7 8	8 6	8 2	8 0	6 0	4 9	4 6	4 2	4 5	7 0
1892.....	5 2	4 1	6 5	7 5	7 6	8 4	7 5	5 0	4 0	4 3	5 4	5 7
1893.....	4 5	7 6	6 7	8 0	9 1	8 5	6 0	4 9	6 3	4 9	6 2	4 0
1894.....	7 0	6 5	7 4	8 2	7 5	7 8	5 5	5 1	6 6	5 0	4 0	7 0
1895.....	7 4	5 0	7 3	7 1	9 1	8 2	6 4	4 9	4 2	4 2	5 2	5 5
1896.....	7 3	6 1	8 3	8 3	9 8	8 3	5 4	5 3	4 4	4 6	6 4	5 6
1897.....	4 7	5 9	8 4	7 1	7 3	6 7	8 2	4 8	5 2	5 1	4 7	5 7
1898.....	5 4	6 7	7 2	8 9	7 2	8 7	6 4	5 0	4 8	4 5	4 7	3 9
1899.....	5 8	6 6	6 8	7 8	8 6	8 6	6 3	5 4	4 0	5 4	6 4	5 0
1900.....	4 1	5 7	6 0	9 6	7 6	7 3	6 3	5 8	6 3	6 0	4 0	6 4
Average .....	5 8	6 1	7 3	7 9	8 0	7 8	6 4	5 1	4 9	4 8	4 9	5 5



## HIGHEST WIND VELOCITY, DIRECTION, AND DATE FOR EACH MONTH FROM JANUARY 1, 1888.

Months.	Veloc- ity.	Direc- tion.	Day and year.	Months.	Veloc- ity.	Direc- tion.	Day and year.	Months.	Veloc- ity.	Direc- tion.	Day and year.
	<i>Miles.</i>				<i>Miles.</i>				<i>Miles.</i>		
January.....	44	S.	1, 1894	May.....	46	NW.	14, 1896	September.....	44	NW.	21, 1900
February.....	48	NW.	29, 1896	June.....	47	N.	22, 1892	October.....	38	N.	13, 1888
March.....	46	NW.	2, 1894	July.....	44	NW.	17, 1887	November.....	40	S.	27, 1892
April.....	42	N.	11, 1890	August.....	36	NW.	27, 1892	December.....	50	SW.	24, 1892

a Also on October 3, 1895.

## AVERAGE HUMIDITY (PER CENT).

[Record began January 1, 1887.]

Month.	A. M.	P. M.	Aver- age.	Month.	A. M.	P. M.	Aver- age.	Month.	A. M.	P. M.	Aver- age.
January.....	91	83	87	May.....	92	80	86	September.....	94	83	88
February.....	91	80	86	June.....	98	80	86	October.....	98	85	89
March.....	90	79	84	July.....	94	82	88	November.....	92	84	88
April.....	91	80	86	August.....	95	85	90	December.....	89	82	86

## NUMBER OF FOGGY DAYS AND THUNDER STORMS IN FOURTEEN YEARS.

[Record began January 1, 1887.]

Month.	Number of—		Month.	Number of—		Month.	Number of—	
	Foggy days.	Thun- der storms.		Foggy days.	Thun- der storms.		Foggy days.	Thun- der storms.
January.....	52	2	May.....	22	4	September.....	25	1
February.....	22	1	June.....	25	1	October.....	118	1
March.....	32	2	July.....	109	0	November.....	56	3
April.....	12	0	August.....	96	3	December.....	25	9

## TOTAL NUMBER OF DAYS WITH PRECIPITATION SINCE JANUARY 1, 1887.

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Less than 0.01.....	10	17	10	11	11	7	3	3	7	13	7	13
0.01 to 0.10.....	65	65	65	62	68	47	11	25	34	57	56	67
0.11 to 0.25.....	40	53	42	52	34	25	3	3	13	30	29	51
0.26 to 0.50.....	63	49	58	35	21	13	1	1	11	25	47	43
0.51 to 1.00.....	45	29	42	21	16	4	0	0	5	15	31	39
Over 1.00 inch.....	23	24	19	14	10	3	0	0	3	9	15	30

## GREATEST PRECIPITATION IN TWENTY-FOUR HOURS FOR EACH MONTH.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Greatest annual.
1887.....	2.19	2.88	0.88	1.64	1.05	1.55	0.02	0.03	0.20	0.34	0.91	0.88	2.88
1888.....	3.91	0.80	0.97	0.30	0.30	1.99	0.44	T.	0.04	0.42	1.18	1.71	3.91
1889.....	1.58	0.65	1.71	1.02	1.54	0.36	0.04	0.09	0.13	3.06	0.79	2.43	3.06
1890.....	3.72	4.91	2.90	1.37	0.83	0.35	0.06	0.01	0.63	0.41	0.08	2.21	4.91
1891.....	0.94	1.96	1.24	2.09	0.76	0.43	0.14	0.24	0.73	0.52	0.99	2.22	2.22
1892.....	1.18	0.72	1.27	1.10	1.40	0.14	0.00	0.05	0.63	1.27	2.33	2.73	2.73
1893.....	0.98	1.57	2.06	1.13	0.68	0.22	0.00	0.00	0.81	2.12	3.70	2.46	3.70
1894.....	3.72	1.05	1.60	1.27	0.52	0.54	0.02	0.04	1.51	1.07	1.19	3.47	3.72
1895.....	2.20	1.77	1.86	0.53	2.24	0.04	0.12	0.07	2.77	0.03	1.32	1.88	2.77
1896.....	1.34	1.31	1.86	2.37	1.36	0.27	0.00	0.60	1.46	0.94	3.04	2.69	3.04
1897.....	1.16	2.43	1.56	0.99	0.25	0.62	0.02	0.03	0.75	1.09	1.54	1.88	2.43
1898.....	0.63	2.14	0.62	1.35	0.36	0.60	T.	0.06	0.30	0.62	1.02	0.30	2.14
1899.....	1.16	3.17	1.60	0.55	1.23	0.36	0.00	0.24	0.74	1.90	3.38	1.37	3.38
1900.....	2.16	2.02	1.10	1.91	1.40	1.26	T.	0.07	0.10	2.05	2.67	1.52	2.67
Greatest.....	3.91	4.91	2.90	2.37	2.24	1.99	0.44	0.60	2.77	3.06	3.70	3.47	.....
Date.....	30	3	4	12-13	25-26	13-14	11-12	30-31	11-12	7-8	26-27	20-21	.....
Year.....	1888	1890	1890	1896	1895	1888	1888	1896	1895	1889	1893	1894	.....

CLIMATOLOGY OF CALIFORNIA.

ANNUAL METEOROLOGICAL SUMMARY FOR THE YEARS 1899 AND 1900.<sup>a</sup>

[ $\lambda = 40^{\circ} 48' \text{ N.}$ ,  $\phi = 124^{\circ} 11' \text{ W.}$ ; gravity corr.,  $-0.01$ ]

Date	Pressure			Temperature.								Moisture									
				Mean					Extremes		Dew-point		Relative humidity		Vapor pressure		Precipitation		Cloudiness		
	Monthly mean	Extremes							Maximum	Minimum	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	Total	Maximum in 24 hours	8 a. m.	8 p. m.	Daylight
		Maximum	Minimum	8 a. m.	8 p. m.	Maximum	Minimum	Monthly													
1899.	In	In	In	o	o	o	o	o	o	o	o	o	o	o	In	In	In	In			
January. ....	30 06	30.44	29 25	44.8	51 0	53 0	42 0	47 5	61	34	41	45	87	80	0 269	0 299	6 50	1 16	4 9	6 0	6 9
February. ....	30 19	30.47	26 68	42 1	46 8	48 9	40 0	44 4	55	24	39	41	88	82	0 241	0 268	5 08	3 17	5 0	5 9	6 2
March. ....	29 98	30.42	29 47	44.8	50 9	53 4	42 5	48 0	64	35	42	43	90	76	0 269	0 281	8 53	1 60	6 8	6 0	6 1
April. ....	30 06	30.29	29 64	44 6	51 5	53 8	43 2	48 2	58	38	41	44	88	75	0 261	0 285	1 91	0 55	4 9	4 9	5 0
May. ....	30 07	30 27	29 59	46 7	51.6	53.4	45 7	49 6	59	37	43	44	88	76	0 282	0 290	1 73	1 23	7 2	5 5	5 8
June. ....	30 03	30.22	29 82	48 5	55 1	56 2	47 8	52 0	61	40	46	48	92	76	0 314	0 330	0 75	0 36	5 4	2 1	3 0
July. ....	29 99	30 13	29 84	51 8	57 0	58 6	51 1	54 8	62	46	50	51	92	80	0 354	0 375	0 00	0 00	8 5	5 3	6 3
August. ....	29 96	30 13	29 83	53 0	58 5	59 8	52 0	55 9	67	48	51	52	92	80	0 369	0 392	0 42	0 24	7 6	4 5	5 8
September. ....	30 01	30 15	29 80	51 7	57 2	59 2	50 5	54 8	74	46	50	52	94	88	0 360	0 386	0 88	0 74	3 3	4 9	6 7
October. ....	29 99	30 29	29 55	48 7	55 5	57.9	46 1	52.0	76	39	45	48	88	78	0 301	0 336	4 28	1 90	3 3	5 0	5 5
November. ....	29 92	30 28	29 53	53 9	58 4	61 3	50 5	55 9	69	41	48	51	83	78	0 345	0 377	14 80	3 38	5 7	7 2	7 3
December. ....	30 08	30 53	29 55	44 4	61 7	54 1	41 8	48 0	61	33	42	46	91	82	0 269	0 313	7 05	1 87	4 7	5 5	6 2
Year. ....	30 03	30 53	29 25	47 9	53 8	55 8	46 1	50 9	76	24	45	47	89	79	0 302	0 323	51 83	3 38	5 6	5 2	5 9
1900																					
January. ....	30 07	30 42	29 63	47 6	53 6	55 6	45 3	50 4	66	35	45	48	91	82	0 302	0 337	6 63	2 16	4 9	5 3	6 5
February. ....	30 13	30 41	29 88	46 0	51 7	53 5	43 8	48 6	63	36	43	46	90	81	0 280	0 310	6 04	2 02	6 7	5 7	6 3
March. ....	29 99	30 22	29 68	47 6	52 8	55 2	45.8	50 5	64	37	45	47	91	81	0 300	0 323	3 42	1 10	5 7	8 0	7 0
April. ....	29 97	30 19	29 72	46 7	53 7	56 0	45.0	50 5	63	36	43	45	87	74	0 280	0 305	4 43	1 91	5 8	4 6	4 8
May. ....	30 01	30 23	29 72	50 9	57 2	59 0	49.7	54 4	66	43	46	50	86	76	0 318	0 357	2 08	1 40	6 6	6 1	5 4
June. ....	29 95	30 12	29 78	53 0	58 5	60 0	52.5	56 2	70	48	51	52	93	80	0 373	0 394	1 70	1 26	7 2	5 5	6 1
July. ....	29 92	30 10	29 74	53 6	59 2	60 5	52.4	56 4	66	48	51	52	91	77	0 374	0 386	T	T	7.7	3 3	4 6
August. ....	29 96	30 18	29 79	53 8	59 8	61 1	52.8	57 0	66	47	52	53	92	75	0 382	0 401	0 07	0 07	5 0	2.3	4 7
September. ....	29 94	30 15	29 75	52 7	59 8	61 6	51.7	56 6	69	45	50	53	91	78	0.363	0 399	0 21	0 10	5 5	3 1	4 3
October. ....	29 95	30 28	29 49	50 3	56 7	59 1	48.4	53 8	67	39	48	53	93	86	0 341	0 398	7 07	2 05	4 8	5 4	5 7
November. ....	29 96	30 34	29 42	50 1	55.8	58 6	48 0	53 3	72	36	48	52	93	88	0 339	0 398	8 05	2 67	3 7	7 2	6 5
December. ....	30 09	30 32	29 53	49 0	54 2	56 2	45 5	50.8	65	34	45	48	86	79	0 302	0 332	5 27	1 52	5 5	4 5	5 3
Year. ....	30 00	30 42	29 42	50 1	56 1	58 0	48 4	53.2	72	34	47	50	90	80	0 330	0 361	44 98	2 67	5 8	5.1	5 6

<sup>a</sup> From observations at 8 a. m. and 8 p. m. 75th meridian time Local mean time 3 h 17 m. slow.

## ANNUAL METEOROLOGICAL SUMMARY FOR THE YEARS 1899 AND 1900.

[H = 82 ft.; ht = 60 ft.; hr = 52 ft.; ha = 69 ft.]

Wind.																	Number of days.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
Date.	Average hourly velocity.	Prevailing direction.	Maximum velocity.	Direction at time of maximum velocity.	Number of days with gales.	Number of winds, 8 a. m. and 8 p. m.											Precipitation.		Maximum temperature below 32°.			Electricity.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
						North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calm.	Clear.	Partly cloudy.	Cloudy.	0.01 inch and over.	0.04 inch and over.	Snow.	Hail.		Fog.	Below 32°.	Above 90°.	Minimum temperature below 32°.	Thunderstorms.	Auroras.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
1899.	Miles.		Mi.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									

CLIMATOLOGY OF CALIFORNIA.

SUNSHINE DURING THE YEARS 1898, 1899, AND 1900.

[N lat 40° 48']

	Percentage of sunshine recorded during hours ending (local time)—																Total (hours)	Per- centage of pos- sible
	5 <sup>h</sup> a m	6 <sup>h</sup>	7 <sup>h</sup>	8 <sup>h</sup>	9 <sup>h</sup>	10 <sup>h</sup>	11 <sup>h</sup>	Noon	1 <sup>h</sup>	2 <sup>h</sup>	3 <sup>h</sup>	4 <sup>h</sup>	5 <sup>h</sup>	6 <sup>h</sup>	7 <sup>h</sup>	8 <sup>h</sup>		
1898																		
January				33	37	46	52	49	59	57	61	55	46	41	..	.....	149 4	50
February			15	19	33	43	40	41	41	41	39	31	19	9	..	.....	99 0	38
March		50	42	45	51	50	62	64	70	70	66	58	59	51	57	.....	213 7	58
April	0	25	30	32	43	50	56	59	55	58	47	47	47	41	37	.....	181 6	45
May	14	18	25	40	42	46	53	58	63	66	60	54	49	50	44	40	210 3	47
June	26	28	31	44	51	55	47	50	57	63	61	58	52	47	47	48	219 2	49
July	4	8	9	13	19	30	44	55	59	55	56	54	51	56	46	45	179 7	39
August	0	0	3	8	13	25	26	38	49	61	55	47	39	40	34	15	135 1	32
September		11	13	19	24	34	42	37	52	47	45	51	49	42	50	..	140 2	37
October		0	30	40	41	49	59	68	70	67	65	56	55	49	..	..	188 9	55
November			35	30	36	41	42	42	46	46	51	51	54	..	..	..	124 7	42
December				37	38	46	44	58	61	58	58	52	44	..	..	..	144 7	50
Sum	44	140	233	360	428	515	567	619	682	689	664	614	564	426	315	148	1,986 5	537
Percentage of possible				30	36	43	47	52	57	57	55	51	47	..	..	..	165 5	45
1899																		
January				28	26	35	42	45	45	42	45	39	37	71	....	..	116 3	39
February			9	15	30	43	52	52	44	50	46	43	41	40	..	..	123.2	41
March		17	27	30	38	46	59	58	53	59	60	55	41	32	33	..	173 0	47
April	0	30	34	41	48	69	72	68	64	70	71	71	63	50	45	..	230 9	58
May	18	18	28	36	41	45	58	61	56	65	68	62	56	44	36	34	212 9	47
June	23	27	39	43	52	61	73	78	89	88	87	87	78	75	73	72	300 3	66
July	12	13	13	17	24	27	30	45	48	49	52	49	48	50	48	49	167 8	37
August	0	22	21	28	31	35	47	49	60	63	65	60	56	50	49	55	195 5	46
September		19	13	17	23	21	37	46	51	58	57	55	47	42	52	..	144 9	39
October		55	31	33	41	43	47	58	60	67	69	57	51	51	..	..	172.6	50
November			18	16	52	42	42	43	33	35	32	32	19	..	..	..	96 9	33
December				19	30	36	43	54	56	57	46	46	39	..	..	..	125 2	44
Sum	53	201	233	323	436	503	602	657	659	703	688	656	576	505	336	210	2,059.5	547
Percentage of possible				27	36	42	50	55	55	58	57	55	48	..	..	..	171 6	46
1900																		
January				24	31	41	50	48	51	54	48	42	38	59	.....	....	129 5	43
February			3	14	21	32	51	54	54	49	46	51	34	25	..	.....	117 4	39
March		33	25	27	34	40	47	52	44	44	36	29	26	18	17	.....	180.6	35
April	0	47	45	51	56	60	59	64	63	64	60	63	62	60	54	.....	232 4	58
May	28	24	30	50	48	59	65	64	53	60	61	56	51	45	33	48	223 6	50
June	13	13	18	23	34	45	46	53	58	64	60	53	47	42	34	32	184 4	41
July	14	12	15	20	28	44	58	68	77	79	79	76	71	67	65	65	246 4	54
August	100	32	33	32	42	54	61	69	74	70	73	75	73	75	69	95	255 2	60
September		20	25	31	48	54	59	69	78	74	71	74	65	54	50	..	214.3	59
October		0	21	28	40	50	56	55	61	51	47	42	38	38	.....	..	154 3	45
November			17	18	30	39	39	42	43	37	36	21	15	..	..	..	95 7	32
December				27	30	47	54	51	50	52	53	45	38	..	..	..	131 1	46
Sum	155	181	232	345	442	565	645	689	714	698	670	627	558	483	322	240	2,114 9	562
Percentage of possible				29	37	47	54	57	60	58	56	52	46	..	..	..	176 2	47

Some time ago the observer at Eureka arranged with the Humboldt Jetty office for gratuitous daily information respecting the approximate force and direction of the wind and the condition of the ocean adjacent to the bay. To the harbor entrance is a distance of about 7 miles, and the two jetties there extend out into the ocean 7,000 feet. Very often when outside there is a gale with an extremely rough sea; inside there is a calm or a wind from a different direction.

Herewith is a rough sketch of the coast from Cape Mendocino to Patricks Point, a distance of about 40 miles. The coast line is some 10 miles east of a line joining the bluff points of Cape Mendocino and Patricks Point. Still farther to the east the hills form a greater curve, placing the lowlands on which Eureka stands in a protected position from the northwest, east, and southeast, and greatly modifying the conditions prevailing beyond the limits of the area shown in the sketch.

By running a line from the cape to the point one will probably discover that during a severe southeast storm from, say, 20 to 50 miles off coast there is often inside the line or near the coast but a moderate wind. Moreover, a west to northwest wind is much more severe outside than inside this line. The force of southeast winds is no doubt frequently broken by Cape Mendocino and the adjacent hills. Greatly modified in intensity and somewhat deflected, they again approach the coast north of Patricks Point; but in a heavy south wind the resistance of the cape seems inconsiderable. Often in summer, during a moderate wind of 15 miles or more at sea, near the coast and even on the bay it will blow quite strongly. On this coast only seldom does a wind for any great length of time blow directly from the southwest. On its approach to the land it will veer either to the south or to the northwest. During a southeast wind along the coast there is invariably a southwest wind at sea. After a southeast storm a heavy sea from the southwest causes the bay to become rough and extremely dangerous for vessels. Frequently on approaching the coast northwesterly winds will be met by warm currents of air from the land. The result in every instance is fog, and generally a material reduction in the force of the wind. In forecasting southeast storms the high hills east and southeast of this station and extending to Cape Mendocino should be allowed for.

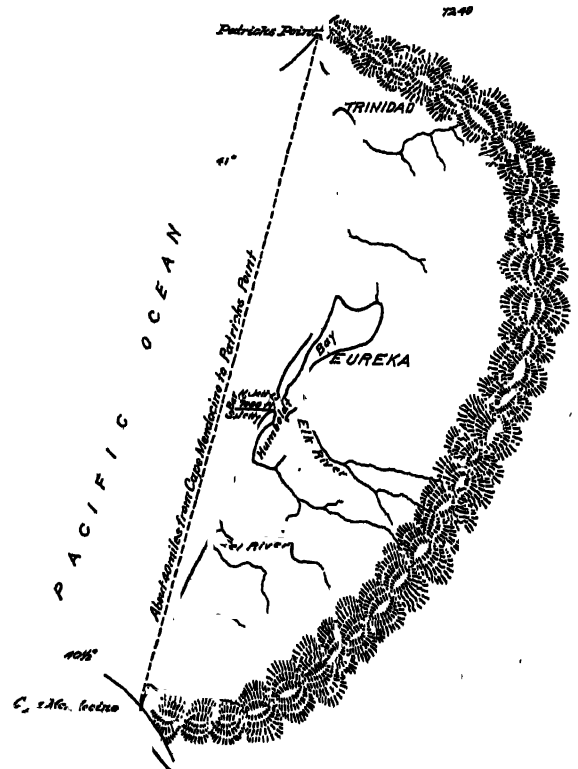


FIG. 5.—Sketch map of Eureka and vicinity.

#### CLIMATE OF SAN FRANCISCO.

On the coast of California there is a city justly famed for the abnormalities of its climate. Overcoats and heavy wraps are worn in midsummer, while the lilies bloom in December. From May until September very little rain falls, yet during this period with clock-like regularity great banks of fog march in every afternoon and cover the bare, brown hills. The city of San Francisco, the gateway to the Orient, as it has been termed, is strangely situated with respect to ocean, bay, mountain, and valley. It may perhaps be said of this city that nowhere else can such a strange mixture of marine and continental climates be found. The topography is such that marked contrasts can be found within comparatively short distances. Certainly the climatologist finds in the vicinity of San Francisco so many climatic anomalies that he feels as if he

were in fact present in a great natural aero-physical laboratory where daily experiments were being performed on a large scale. In building this meteorological laboratory at San Francisco nature also provided seats wherefrom we can obtain excellent views of the experiments while in progress. From the Weather Bureau station on Mount Tamalpais—elevation of station, 2,373 feet—one looks down on the broad expanse of the Pacific, nearly 20,000,000 square miles of water, to the north, west, and south. From the open roadstead of Drakes Bay the eye passes over the Sausalito hills to the headlands of Points Bonita and Lobos, marking the entrance to the Golden Gate. This passage plays an important rôle in connection with the winds, temperatures, and fogs of the San Francisco Bay region. At mean tide the area of San Francisco Bay is about 450 square miles.

Far on the eastern horizon, especially on clear winter days, the snow of the Sierra—155 miles distant—can be seen glistening. These mountains vary in height from 8,000 to 14,000 feet.

Extending from the slopes of the Sierra to the Coast Range is a great basin 500 miles long and about 50 wide. The Sacramento and San Joaquin rivers, flowing through this basin, unite in Suisun Bay. This great inland basin, surrounded by mountain walls, is connected with the Pacific Ocean by the gate at San Francisco, San Francisco Bay, San Pablo Bay, Carquinez Straits, and Suisun Bay. Here, then, is an aero-physical laboratory par excellence. Now for the results.

When a native of San Francisco is asked which is the coldest month of the year, he is generally at a loss for an answer; and if asked which is the warmest he may say November. This confusion arises from the comparatively small range of temperature. The mean annual temperature, as determined from the records of the Weather Bureau for thirty-one years is  $56.1^{\circ}$  F. May and November have practically the same temperature. The warmest month is September,  $60.8^{\circ}$ ; the coldest, January,  $50.2^{\circ}$ . The other months have mean temperatures as follows: February,  $52^{\circ}$ ; March,  $54^{\circ}$ ; April,  $55^{\circ}$ ; May,  $57^{\circ}$ ; June, July, and August,  $59^{\circ}$ ; October,  $60^{\circ}$ ; November,  $56^{\circ}$ ; December,  $52^{\circ}$ .

The highest temperature ever recorded at San Francisco was  $100^{\circ}$ , on June 29, 1891, and the lowest  $29^{\circ}$ , on January 15, 1888. Abnormally warm and cold periods last, as a rule, about three days. The mean of the three consecutive warmest days at San Francisco has never exceeded  $76.3^{\circ}$ . A period of warm weather during the summer months is, as a rule, brought to a close about the evening of the third day with strong west winds, dense fog, and temperatures ranging from  $49^{\circ}$  to  $54^{\circ}$ . The mean of the three consecutive coldest days was  $40.7^{\circ}$ . The greatest daily range of temperature was  $43^{\circ}$ , on June 29, 1891. This was the date when the temperature reached  $100^{\circ}$ . The range of temperature was from  $100^{\circ}$  to  $57^{\circ}$ . The morning was calm and very warm, while at 5 p. m. the temperature was  $80^{\circ}$  and next morning  $74^{\circ}$ .

In the past thirty years the number of days on which snow has fallen can be counted on the ten fingers. Thunderstorms likewise are infrequent, but not altogether unknown. Earthquakes, meaning by this all slight shocks and tremors, average about 7 per annum. Very little damage has been done by earthquakes during the past fifty years.

The people in San Francisco have long realized that winter and summer are purely relative terms. Thus at any of the ferries on a midsummer day one can see summer fabrics worn with heavy wraps, and it is not unusual to see white duck and sealskin in combination. Visitors to the city should by all means wear heavy wraps or overcoats during the summer afternoon.

The experiments of the observers of the Weather Bureau during the past two years with kites have thrown much light upon the causes of the climatic abnormalities experienced at San Francisco; and, among other things, it has become evident that in summer as we ascend from the ground the temperature rises. For each 155 feet of elevation the temperature is  $1^{\circ}$  F. warmer, and so on any of the hills or mountains in the vicinity of San Francisco one can find with very little effort the climate best suited for him. In other words, the citizen of the San Francisco Bay section can regulate the temperature to suit himself, having a choice between these limits:  $55^{\circ}$  at sea level and  $85^{\circ}$  at 2,000 feet above.

With regard to rainfall, during the summer months, San Francisco is practically rainless. By referring to the accompanying charts it will be seen that in June, July, August, and September showers are very rare. The average rainfall is about 23 inches, and most of this falls during the months of November, December, January, February, and March. Looking over the records of the past fifty years we find that the year 1898 had but 9.31 inches, while in 1883 there was 38.82 inches. In 1861 there was 38.51 inches.

## SEASONAL RAINFALL.

The annual rainfalls do not, however, fairly represent the amount of rainfall determining crop yield. Both with fruits and grains it is the seasonal rainfall rather than the annual which is to be considered. In the wheat fields summer fallowing is resorted to chiefly for the reason that the rain of two seasons can be utilized. As may be seen by the tables of annual and seasonal rainfall, published in following pages, the amounts during the growing season vary from the totals for the calendar year; thus, in 1889-90 the seasonal rainfall was 45.85 inches. The annual rainfall for 1890 was but 25.43 inches, an unusually heavy rainfall in December, 1889, having contributed to materially increase the seasonal amount.

Frequency as well as intensity should also be taken into account in considering the relation of rainfall and crops.

## MONTHLY MEAN TEMPERATURES (DEGREES FAHRENHEIT).

	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1871.....			51.3	53.3	54.3	50.9	56.6	57.9	60.4	61.8	55.1	52.9	56.0
1872.....	52.2	54.2	54.3	53.4	56.0	59.8	57.9	59.8	59.3	58.8	56.0	52.1	56.2
1873.....	54.8	50.9	54.5	54.6	55.4	57.1	58.1	59.5	58.3	59.7	57.7	50.7	55.9
1874.....	49.3	51.2	50.9	54.9	57.6	59.1	57.8	59.0	61.4	59.8	56.1	50.3	55.6
1875.....	49.0	52.0	51.8	55.4	57.2	59.4	58.8	58.8	59.2	62.0	57.4	51.4	56.0
1876.....	48.8	52.8	53.2	55.4	56.8	61.4	59.1	59.6	61.5	59.9	58.0	53.0	56.6
1877.....	54.3	55.8	57.2	54.4	56.2	62.0	60.8	59.8	62.5	59.2	57.2	52.7	57.7
1878.....	52.8	53.3	55.9	56.0	58.0	58.8	58.6	59.1	60.2	61.6	57.1	51.6	56.9
1879.....	48.8	54.6	57.2	56.5	56.4	60.2	58.7	60.5	61.0	61.0	55.0	50.0	56.7
1880.....	48.0	48.8	49.4	53.3	57.7	57.2	58.8	59.1	58.9	59.8	54.2	53.2	54.9
1881.....	54.0	55.3	54.4	57.9	58.0	58.6	59.7	58.8	59.7	56.6	55.1	51.0	56.6
1882.....	49.4	48.8	53.4	53.0	57.0	57.9	59.5	58.6	59.8	58.8	58.2	52.8	55.2
1883.....	47.0	48.8	54.0	53.2	58.0	61.4	59.8	59.2	63.1	57.9	54.1	50.8	55.6
1884.....	50.6	50.8	54.5	56.0	59.4	60.2	61.4	60.0	59.6	58.2	57.4	52.8	56.7
1885.....	51.1	55.3	57.7	58.2	58.1	57.8	61.6	59.6	61.8	60.7	57.8	54.0	57.8
1886.....	51.2	56.8	58.6	55.4	59.1	59.4	60.3	60.6	62.4	58.6	56.8	53.6	57.3
1887.....	52.6	47.8	55.8	55.8	57.0	59.4	56.6	57.8	62.0	64.2	56.4	52.2	56.5
1888.....	46.7	53.9	53.4	57.8	56.9	62.4	61.4	60.8	62.6	61.6	57.0	53.2	57.3
1889.....	50.4	54.0	57.2	58.8	58.8	60.2	58.8	60.4	64.6	61.8	58.6	51.3	57.9
1890.....	46.2	49.1	53.8	54.8	59.4	59.2	59.8	61.4	60.4	62.4	59.0	49.8	56.3
1891.....	52.2	51.1	55.0	53.4	55.7	60.2	59.4	61.8	61.8	59.7	58.6	49.6	56.6
1892.....	51.7	52.4	54.2	53.1	58.0	56.8	58.1	59.4	60.2	59.6	56.9	51.1	56.0
1893.....	47.4	50.3	51.2	52.4	55.8	56.5	56.6	56.6	59.3	57.6	55.6	52.4	54.3
1894.....	47.7	48.4	50.6	55.2	55.4	55.9	56.4	59.2	63.4	59.6	59.4	49.7	55.1
1895.....	48.6	53.8	52.2	54.8	57.6	58.7	58.4	58.4	60.7	58.8	56.2	48.6	55.6
1896.....	52.2	55.8	54.3	51.6	56.3	57.2	59.4	59.5	59.6	58.8	58.4	52.8	55.9
1897.....	48.6	50.7	48.9	57.4	57.4	58.9	58.2	57.4	60.8	58.4	58.1	50.7	55.0
1898.....	46.7	52.6	51.2	54.4	52.6	59.0	56.2	57.0	59.0	61.2	55.4	49.7	54.6
1899.....	53.0	51.6	52.2	54.6	52.6	56.9	55.9	58.3	58.2	59.3	56.8	49.6	55.0
1900.....	50.7	53.6	55.2	54.0	57.6	58.2	59.7	63.3	58.8	56.8	50.2	56.2	
1901.....	49.8	52.2	55.8	51.8	58.9	56.7	55.6	56.4	58.5	61.8	57.2	52.9	55.2
Means, 31 years, except Jan- uary and February.....	50.2	52.2	53.7	54.9	56.8	58.8	58.6	59.2	60.8	60.0	56.4	51.5	56.1

CLIMATOLOGY OF CALIFORNIA.

SUMMARY OF MONTHLY MEAN TEMPERATURES (DEGREES FAHRENHEIT)

Month	Highest monthly mean		Lowest monthly mean		Absolute maximum		Absolute minimum		Greatest daily range	Mean daily range	Mean variability	Mean of three consecutive warmest days <sup>a</sup>	Mean of three consecutive coldest days <sup>a</sup>
	Date	Temperature	Date	Temperature	Date	Temperature	Date	Temperature					
January . . . . .	1873	54 8	1890	46 2	26, 1899	78 0	15, 1888	29 0	24 0	9 9	2 2	67 0	42 0
February . . . . .	1886	56 8	1887	47 8	18, 1899	80 0	5, 1887	33 0	27 0	10 7	2 0	64 7	40 7
March . . . . .	1885	57 7	1897	48 9	7, 1892	80 0	3, 1896	33 0	28 0	11 3	2 5	67 7	40 7
April . . . . .	1889	58 8	1891	51 6	14, 1888	88 0	7, 1891	40 0	34 0	11 7	2 7	68 7	48 3
May . . . . .	1890	59 8	1898	52 6	28, 1887	97 0	1, 1899	43 0	39 0	12 0	2 9	73 7	49 7
June . . . . .	1888	62 4	1894	55 9	29, 1891	100 0	19, 1893	47 0	43 0	12 5	2 4	76 0	52 3
July . . . . .	1885	61 6	1898	56.2	15, 1888	93 0	31, 1893	47 0	36 0	11 5	2 4	66 3	50 0
August . . . . .	1891	61 8	1893	56 6	22, 1891	92 0	8, 1893	47 0	38 0	11 4	2 4	76 0	52 7
September . . . . .	1889	64 6	1873	58 3	22, 1894	94 0	30, 1894	49 0	35 0	13 3	3 0	76.3	54 0
October . . . . .	1887	64 2	1881	56 6	8, 1899	94 0	14, 1881	45 0	31 0	13 3	3 5	71 7	51 7
November . . . . .	1894	59 4	1897	53 1	16, 1895	83 0	27, 1896	38 0	25 0	11.3	2 6	69 3	44 7
December . . . . .	1885	54 0	1895	48 6	8, 1893	72 0	24, 1879	34 0	21 0	9 3	2 2	62 0	42 3
Annual . . . . .	1889	57 9	1893	54 3	b 1891	100 0	c 1888	29 0	43 0	11 5	2 6	76.3	40 7

<sup>a</sup> Record subsequent to January 1, 1891

<sup>b</sup> June 29

<sup>c</sup> January 15

WEATHER.

Month	Average number of—				Month	Average number of—			
	Clear days	Partly cloudy days.	Cloudy days	Rainy days		Clear days	Partly cloudy days	cloudy days	Rainy days
January . . . . .	11	10	10	11	August . . . . .	10	15	6	0
February . . . . .	10	10	8	10	September . . . . .	14	12	4	2
March . . . . .	11	11	9	10	October . . . . .	16	11	4	4
April . . . . .	12	12	6	7	November . . . . .	15	9	6	7
May . . . . .	13	12	6	4	December . . . . .	12	10	9	11
June . . . . .	14	11	5	2	Annual . . . . .	149	137	79	69
July . . . . .	11	14	6	1					

AVERAGE TEMPERATURE (DEGREES FAHRENHEIT) FOR EACH HOUR OF SEVENTY-FIFTH MERIDIAN TIME

[ $\lambda=37^{\circ} 48' N$ ,  $\phi=122^{\circ} 23' W$ ]

1900	1 <sup>h</sup> a. m.	2 <sup>h</sup>	3 <sup>h</sup>	4 <sup>h</sup>	5 <sup>h</sup>	6 <sup>h</sup>	7 <sup>h</sup>	8 <sup>h</sup>	9 <sup>h</sup>	10 <sup>h</sup>	11 <sup>h</sup>	Noon	1 <sup>h</sup> p m
January . . . . .	50 1	49 8	49 2	49 0	48 5	48 2	48 2	48 8	48 2	47 6	47 5	48 0	49 1
February . . . . .	52 0	51 3	50 9	50 7	50 0	49 6	49 5	49 9	49 0	48 6	48 7	49 9	51 4
March . . . . .	52 8	51 8	51 4	50 7	50 6	50 4	50 1	51 2	50 2	49 7	50 5	52.0	53 7
April . . . . .	51 4	51 1	50 6	50 3	50 1	49 7	49 4	50 1	49 1	49 8	51 5	53 4	55 4
May . . . . .	53 9	53 3	52 7	52 3	51 8	51 5	51 5	52 2	51 2	53 2	55 4	57.4	59 4
June . . . . .	54 4	53.6	53.1	52 7	52 4	52 1	52 0	53 1	52 5	54 0	55 8	56 8	58 9
July . . . . .	53 8	53 6	53 5	53 1	52.8	52 6	52 6	53 5	52 4	54 7	57 1	59 0	60 8
August . . . . .	56 8	56 4	56 0	55 7	55 1	54.9	55 1	55 8	54 7	55 6	57 5	59 4	61 3
September . . . . .	60 0	59 3	58 8	58 5	58 1	57 9	57 6	58 7	57 4	58 5	60 5	62 5	64 8
October . . . . .	56.1	55 8	55 1	54 6	53 9	53 7	53 5	54 7	53 5	53 9	55 2	56 5	58 7
November . . . . .	55 5	54 9	54 2	54 0	53 3	52 9	52 4	53.9	52 5	52.0	52 6	54.1	55 4
December . . . . .	49 5	48 8	48 2	47 5	47 1	46.9	47 1	48 4	47 2	46 9	47 1	48 3	49 4
Year . . . . .	53 9	53 3	52 8	52 4	52 0	51 7	51 6	52 5	51 5	52 0	53 3	54 8	56 5



## AVERAGE TEMPERATURE (DEGREES FAHRENHEIT) FOR EACH HOUR OF SEVENTY-FIFTH MERIDIAN TIME—Continued.

[ $h_1$  = 161 ft.; local time, 3<sup>h</sup> 10<sup>m</sup> slow.]

1900.	2 <sup>h</sup>	3 <sup>h</sup>	4 <sup>h</sup>	5 <sup>h</sup>	6 <sup>h</sup>	7 <sup>h</sup>	8 <sup>h</sup>	9 <sup>h</sup>	10 <sup>h</sup>	11 <sup>h</sup>	Mid.	Mean.	Mean max.	Mean min.
January.....	50.3	51.6	52.8	53.4	53.9	53.8	52.9	52.5	51.9	51.3	50.5	50.3	54.7	46.7
February.....	53.2	55.0	56.9	58.2	58.6	57.8	56.9	55.3	54.5	53.7	53.1	52.7	59.5	47.8
March.....	55.5	57.4	58.9	59.9	59.5	57.8	57.0	55.5	54.5	53.8	53.2	53.7	61.3	49.1
April.....	56.6	57.5	58.1	57.8	57.5	56.9	55.8	55.0	53.8	52.6	52.2	53.2	59.5	48.4
May.....	60.8	61.8	62.1	61.9	61.8	60.0	59.0	57.8	56.1	54.9	54.5	56.1	63.5	50.6
June.....	60.5	62.1	62.2	62.0	61.5	60.2	59.6	58.3	57.0	55.8	55.1	56.5	63.7	51.6
July.....	61.9	62.3	62.8	62.4	61.4	60.7	59.8	58.2	56.5	55.4	54.6	56.9	64.6	51.9
August.....	62.8	63.6	63.7	63.2	62.5	61.4	60.7	59.5	58.6	57.5	57.2	58.5	65.5	53.9
September.....	66.4	68.3	68.3	67.9	66.9	65.3	64.7	63.1	62.0	61.3	60.5	62.0	70.4	56.2
October.....	60.8	62.4	63.1	63.8	63.1	61.7	60.4	59.3	58.4	57.5	56.9	57.6	65.1	52.4
November.....	56.3	58.0	59.2	60.1	60.1	59.6	58.7	57.9	57.2	56.0	56.0	55.7	62.2	50.4
December.....	50.5	52.0	52.9	53.6	54.0	53.3	52.8	52.5	51.6	50.8	50.0	49.8	55.1	46.4
Year.....	57.9	59.3	60.1	60.4	60.1	59.0	58.2	57.1	56.0	55.1	54.5	55.2	62.1	50.4

## AVERAGE PRESSURE (INCHES AND THOUSANDTHS) FOR EACH HOUR OF SEVENTY-FIFTH MERIDIAN TIME.

[ $\lambda$  = 37° 48' N.;  $\phi$  = 122° 26' W.; local time, 3<sup>h</sup> 10<sup>m</sup> slow. II = 155 ft.]

1900.	1 <sup>h</sup> a. m.	2 <sup>h</sup>	3 <sup>h</sup>	4 <sup>h</sup>	5 <sup>h</sup>	6 <sup>h</sup>	7 <sup>h</sup>	8 <sup>h</sup>	9 <sup>h</sup>	10 <sup>h</sup>	11 <sup>h</sup>	Noon.	1 <sup>h</sup> p. m.
January.....	29.985	0.987	0.983	0.978	0.980	0.982	0.975	0.969	0.971	0.978	0.990	0.006	0.020
February.....	29.998	0.001	0.001	0.999	0.000	0.995	0.991	0.992	0.998	0.006	0.020	0.029	0.037
March.....	29.881	0.881	0.880	0.879	0.875	0.866	0.863	0.864	0.871	0.878	0.890	0.900	0.905
April.....	29.819	0.850	0.848	0.843	0.837	0.832	0.831	0.832	0.848	0.853	0.860	0.866	0.871
May.....	29.803	0.861	0.860	0.855	0.849	0.846	0.845	0.846	0.855	0.865	0.872	0.875	0.877
June.....	29.815	0.814	0.806	0.804	0.800	0.795	0.795	0.798	0.800	0.814	0.827	0.828	0.829
July.....	29.737	0.739	0.737	0.735	0.731	0.730	0.732	0.737	0.748	0.759	0.771	0.774	0.775
August.....	29.805	0.804	0.803	0.800	0.795	0.794	0.793	0.798	0.807	0.817	0.826	0.831	0.835
September.....	29.796	0.797	0.799	0.799	0.797	0.796	0.796	0.800	0.809	0.820	0.824	0.831	0.833
October.....	29.859	0.862	0.861	0.862	0.863	0.858	0.856	0.859	0.866	0.873	0.883	0.890	0.894
November.....	29.898	0.899	0.896	0.892	0.892	0.888	0.887	0.887	0.895	0.904	0.914	0.923	0.932
December.....	30.052	0.054	0.049	0.048	0.047	0.044	0.038	0.029	0.034	0.034	0.045	0.056	0.070
Year.....	29.878	0.879	0.877	0.874	0.872	0.869	0.867	0.868	0.875	0.883	0.894	0.901	0.906

[Correction applied to reduce to standard gravity—0.02.]

1900.	2 <sup>h</sup>	3 <sup>h</sup>	4 <sup>h</sup>	5 <sup>h</sup>	6 <sup>h</sup>	7 <sup>h</sup>	8 <sup>h</sup>	9 <sup>h</sup>	10 <sup>h</sup>	11 <sup>h</sup>	Mid.	Mean.	Mean max.	Mean min.
January.....	0.021	0.999	0.981	0.971	0.968	0.970	0.968	0.974	0.981	0.986	0.992	0.984	0.048	0.980
February.....	0.035	0.020	0.002	0.985	0.977	0.972	0.968	0.972	0.178	0.981	0.988	0.998	0.062	0.935
March.....	0.903	0.805	0.881	0.867	0.857	0.850	0.845	0.847	0.852	0.864	0.889	0.872	0.922	0.820
April.....	0.870	0.864	0.856	0.847	0.837	0.831	0.828	0.827	0.826	0.842	0.851	0.846	0.898	0.798
May.....	0.875	0.869	0.861	0.855	0.846	0.838	0.833	0.830	0.832	0.840	0.852	0.854	0.901	0.809
June.....	0.828	0.824	0.818	0.810	0.802	0.794	0.786	0.783	0.787	0.798	0.804	0.807	0.846	0.765
July.....	0.775	0.772	0.764	0.754	0.742	0.733	0.723	0.723	0.728	0.738	0.741	0.745	0.785	0.707
August.....	0.834	0.827	0.819	0.812	0.802	0.792	0.787	0.782	0.788	0.789	0.798	0.806	0.848	0.759
September.....	0.826	0.818	0.808	0.794	0.784	0.777	0.773	0.777	0.781	0.789	0.796	0.801	0.847	0.747
October.....	0.891	0.883	0.868	0.855	0.849	0.844	0.840	0.844	0.850	0.859	0.866	0.864	0.913	0.812
November.....	0.927	0.913	0.900	0.889	0.883	0.879	0.879	0.884	0.890	0.893	0.898	0.898	0.961	0.837
December.....	0.062	0.048	0.035	0.025	0.023	0.023	0.025	0.029	0.035	0.039	0.044	0.041	0.097	0.991
Year.....	0.904	0.894	0.883	0.872	0.864	0.859	0.855	0.856	0.860	0.867	0.872	0.876	0.927	0.826

## CLIMATOLOGY OF CALIFORNIA.

SUNSHINE FOR THE YEARS 1898, 1899, AND 1900.

[N lat 37° 48']

	Percentage of sunshine recorded during hours ending (local time)—																Total (hours)	Per- centage of pos- sible
	5 <sup>h</sup> a m	6 <sup>h</sup>	7 <sup>h</sup>	8 <sup>h</sup>	9 <sup>h</sup>	10 <sup>h</sup>	11 <sup>h</sup>	Noon	1 <sup>h</sup>	2 <sup>h</sup>	3 <sup>h</sup>	4 <sup>h</sup>	5 <sup>h</sup>	6 <sup>h</sup>	7 <sup>h</sup>	8 <sup>h</sup>		
1898																		
January . . . . .				28	52	75	79	83	81	84	75	58	48	46			204 9	67
February . . . . .			0	7	28	46	64	76	72	75	76	70	54	18			162 3	54
March . . . . .		8	26	55	69	75	81	86	94	98	89	87	85	54	52		277 5	75
April . . . . .		23	35	54	83	90	100	100	100	98	92	80	75	40			813 3	79
May . . . . .	16	10	27	42	62	73	83	85	85	80	79	75	67	46	27	29	262 9	60
June . . . . .	22	32	47	68	77	81	87	94	95	95	94	92	83	70	54	45	328 3	74
July . . . . .	11	13	36	40	60	80	96	98	100	100	99	97	92	70	44	40	322 5	72
August . . . . .		3	16	36	46	73	91	99	99	99	97	93	86	65	30	0	288 3	68
September . . . . .		20	27	33	55	75	90	96	97	96	98	91	74	48	58		268 6	72
October . . . . .		10	17	54	82	95	94	98	96	96	92	88	76	36			277 0	80
November . . . . .			31	40	61	74	86	90	98	96	96	84	49	0			281 0	76
December . . . . .				31	58	74	76	86	87	85	83	75	39				201 3	71
Sum . . . . .	49	119	262	488	733	911	927	986	1,099	1,099	1,076	1,002	833	523	305	114	3,137 9	848
Percentage of possible . . . . .				41	61	76	76	82	92	92	90	84	69				261 5	71
1899																		
January . . . . .				7	24	46	59	67	68	66	64	60	27	31			152 1	50
February . . . . .			30	22	49	68	79	86	94	95	98	92	68	32			215 7	71
March . . . . .		17	21	40	50	58	63	65	62	63	63	55	55	31	0		192 9	52
April . . . . .		51	58	60	79	82	91	96	93	95	96	99	96	81	07		327 7	88
May . . . . .	55	58	59	71	82	85	96	97	97	96	97	96	88	74	68	64	365 1	85
June . . . . .	53	56	60	69	83	98	99	97	100	100	100	100	98	86	79	77	382 4	86
July . . . . .	15	17	25	31	48	65	81	93	96	96	99	97	85	66	38	30	294 1	65
August . . . . .		19	38	43	54	80	90	96	94	97	100	100	88	62	47	0	308 4	73
September . . . . .		23	19	38	70	90	96	100	100	100	100	100	98	58	60		292 5	78
October . . . . .		100	64	62	72	77	84	86	88	89	85	82	71	76			272 5	78
November . . . . .			26	27	33	40	52	51	59	52	54	38	19	0			129 1	42
December . . . . .			0	47	47	61	73	75	78	71	68	62	58				190 5	64
Sum . . . . .	123	341	395	517	691	850	963	1,008	1,029	1,020	1,019	981	851	597	359	171	3,123 0	825
Percentage of possible . . . . .				43	58	71	80	84	86	85	85	82	71				260 2	69
1900																		
January . . . . .				22	24	33	41	59	67	68	67	50	43	41			146 8	48
February . . . . .			28	32	58	74	88	82	87	86	87	85	71	63			222 3	74
March . . . . .		17	21	22	45	69	69	79	82	87	81	78	56	43	57		226 5	61
April . . . . .		55	54	53	61	71	70	75	88	85	86	79	63	45	44		266 5	67
May . . . . .	84	65	66	69	80	88	92	98	97	98	93	89	80	67	62	79	358 1	81
June . . . . .	26	27	27	40	49	68	84	93	96	96	93	89	81	62	53	54	296 3	67
July . . . . .	55	45	46	59	73	92	97	95	99	98	96	94	89	72	61	64	357 8	79
August . . . . .		54	55	65	70	82	89	94	93	98	98	89	77	58	53	100	327 7	78
September . . . . .		60	67	70	73	84	87	87	95	92	93	89	87	77	72		309 9	83
October . . . . .		45	51	53	65	77	86	92	97	95	89	81	69	60			268 9	77
November . . . . .			33	34	46	62	79	88	84	88	85	66	41	0			202 9	67
December . . . . .				100	39	48	54	62	73	75	73	70	59	46			180 0	61
Sum . . . . .	165	368	548	558	702	849	944	1,010	1,060	1,064	1,038	943	803	583	402	297	3,163 7	843
Percentage of possible . . . . .				46	58	71	79	84	88	89	86	79	67				263 6	70

ANNUAL METEOROLOGICAL SUMMARY FOR THE YEARS 1899 AND 1900.<sup>a</sup>[ $\lambda=37^{\circ} 48' N.$ ;  $\phi=122^{\circ} 26' W.$ ; gravity corr.,  $-0.02$ .]

Date.	Pressure.					Temperature.					Moisture.										
	Extremes.		Mean.			Extremes.		Dew-point.	Relative humidity.		Vapor pressure.		Precipitation.	Cloudiness.							
	Monthly mean.	Maximum.	Minimum.	8 a. m.	8 p. m.	Maximum.	Minimum.	Monthly.	Maximum.	Minimum.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	Total.	Maximum in 24 hours.	8 a. m.	8 p. m.	Daylight.
1899.	In.	In.	In.	°	°	°	°	°	°	°	°	°	%	%	In.	In.	In.	In.	°	°	°
January.....	29.98	30.24	29.35	50.1	56.1	58.3	47.6	53.0	78	40	46	46	86	74	0.312	0.315	3.67	0.98	4.8	7.0	6.7
February.....	29.60	30.34	29.62	47.5	54.4	58.0	45.3	51.6	80	34	44	46	88	75	0.295	0.321	0.10	0.08	2.6	3.3	4.6
March.....	29.89	30.21	29.58	49.1	54.7	57.3	47.1	52.2	74	42	47	48	92	81	0.321	0.342	7.61	2.15	4.6	6.4	6.5
April.....	29.87	30.05	29.61	49.6	57.6	61.2	47.9	54.6	80	43	45	45	87	66	0.307	0.311	0.62	0.45	2.9	3.0	3.0
May.....	29.87	30.03	29.61	48.2	54.5	58.3	46.9	52.6	80	43	44	45	88	70	0.295	0.297	0.86	0.77	2.6	2.0	2.6
June.....	29.78	29.97	29.56	52.0	58.0	63.4	50.4	56.9	75	47	49	50	92	74	0.353	0.354	0.01	0.01	3.7	1.5	2.0
July.....	29.78	29.93	29.64	51.5	57.1	61.5	50.3	55.9	73	48	50	51	95	80	0.359	0.370	0.00	0.00	6.3	2.4	3.6
August.....	29.78	29.86	29.66	54.7	60.0	63.5	53.1	58.3	78	50	52	52	92	77	0.391	0.395	T.	T.	7.0	2.5	3.3
September.....	29.83	29.96	29.61	52.4	58.8	65.1	51.3	58.2	73	48	52	53	98	81	0.382	0.399	0.00	0.00	3.1	1.7	3.0
October.....	29.83	30.12	29.45	55.2	60.8	66.1	52.5	59.3	94	46	50	50	85	71	0.364	0.364	3.92	1.94	3.8	3.6	3.0
November.....	29.88	30.10	29.48	54.4	58.6	61.0	52.6	56.8	65	48	52	53	90	82	0.383	0.402	3.79	1.51	4.9	6.4	5.8
December.....	29.58	30.38	29.59	46.9	52.0	54.8	44.4	49.6	63	37	44	44	89	76	0.290	0.296	2.65	1.17	2.1	4.7	3.8
Year.....	29.87	30.34	29.35	51.0	56.9	60.7	49.1	54.9	94	34	48	49	90	76	0.338	0.347	23.23	2.15	4.0	3.7	4.0
1900.																					
January.....	29.97	30.17	29.63	48.8	52.9	54.7	46.7	50.7	64	42	46	48	90	84	0.310	0.335	4.11	1.92	5.6	5.7	5.8
February.....	29.98	30.20	29.62	49.9	56.8	59.5	47.8	53.6	68	44	46	46	88	69	0.315	0.313	0.64	0.50	3.9	4.4	3.8
March.....	29.85	30.12	29.65	51.2	57.0	61.3	49.1	55.2	71	43	48	49	89	76	0.335	0.350	1.91	0.90	4.8	4.6	4.5
April.....	29.83	30.00	29.54	50.2	55.8	59.5	48.4	54.0	69	45	44	46	81	70	0.294	0.312	1.08	0.36	3.8	4.3	3.8
May.....	29.84	30.03	29.67	52.2	59.0	63.5	50.6	57.0	71	47	48	49	86	70	0.337	0.348	0.32	0.22	3.9	4.0	3.3
June.....	29.79	29.96	29.63	53.2	59.6	63.7	51.6	57.6	74	47	51	52	94	76	0.377	0.390	0.05	0.04	6.5	3.7	3.9
July.....	29.73	29.94	29.54	53.5	59.8	64.6	51.9	58.2	73	48	51	52	92	75	0.374	0.381	T.	T.	4.9	1.4	2.0
August.....	29.79	30.03	29.59	55.8	60.7	65.5	53.9	59.7	82	50	52	52	90	76	0.396	0.398	T.	T.	4.7	3.2	3.4
September.....	29.79	29.98	29.41	58.6	64.7	70.4	56.2	63.3	92	47	53	51	84	66	0.409	0.380	0.40	0.45	2.9	2.4	2.6
October.....	29.85	30.07	29.56	54.8	60.4	65.1	52.4	58.8	83	48	51	50	88	71	0.381	0.368	1.48	0.34	4.1	3.9	3.9
November.....	29.88	30.15	29.28	53.9	58.7	62.2	50.4	56.3	79	45	50	50	88	75	0.366	0.361	3.91	1.66	4.6	5.2	5.4
December.....	30.03	30.17	29.68	48.4	52.8	55.1	45.4	50.2	63	40	44	46	86	78	0.293	0.311	1.37	0.74	4.8	4.7	5.0
Year.....	29.86	30.20	29.28	52.5	58.2	62.1	50.4	56.2	92	40	49	49	88	74	0.349	0.354	15.38	1.92	4.5	4.0	4.0

<sup>a</sup>From observations at 8 a. m. and 8 p. m., 76th meridian time. Local mean time 3 h. 10 m. slow.

## CLIMATOLOGY OF CALIFORNIA.

ANNUAL METEOROLOGICAL SUMMARY FOR THE YEARS 1899 AND 1900—Continued.

[H=155 ft, h<sub>1</sub>=161 ft, h<sub>2</sub>=154 ft, h<sub>a</sub>=167 ft]

Date.	Wind.													Number of days																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
	By self-registers					Number of winds, 8 a m and 8 p m.								Precipitation	Snow	Hail	Fog	Maximum temp		Minimum temperature below 32°	Thunderstorms	Auroras.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	Average hourly velocity	Prevailing direction	Maximum velocity	Direction at time of maximum velocity.	Number of days with gales	North	Northeast	East	Southeast	South	Southwest	West	Northwest					Calm	Clear				Partly cloudy	Cloudy	0.01 inch and over	0.04 inch and over	Below 32°	Above 30°																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
1899.	Miles		Mi																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													

## SOME MAXIMUM AND MINIMUM TEMPERATURES.

The following tables showing the temperature when the thermometer registered 80° or above and 32° or below (Fahrenheit), with dates of same, were kindly furnished by Mr. Thomas Tennent. The thermometers used by Mr. Tennent were self-registering instruments purchased from McAllister & Co., of Philadelphia, Pa., and brought out by him in 1849; they were tested and found to be correct. The thermometers were exposed on the north side of a building, on supports about 10 inches from the walls and about 6 feet above the ground. The readings were made by Mr. Tennent personally, and cover the period from September 1, 1849, to December 31, 1871:

*Maximum temperatures.*

	°F.		°F.		°F.
Sept. 6, 1849	80	Sept. 18, 1852	85	May 6, 1865	84
Oct. 13, 1849	81	Nov. 1, 1852	81	June 18, 1865	82
Oct. 15, 1849	84	June 5, 1853	85	June 19, 1865	80
Oct. 16, 1849	85	June 6, 1853	83	Sept. 3, 1865	80
Oct. 17, 1849	80	June 15, 1853	85	Sept. 4, 1865	87
Oct. 18, 1849	81	June 16, 1853	85	Sept. 5, 1865	85
Oct. 27, 1849	82	Sept. 5, 1853	81	Apr. 23, 1866	82
Mar. 28, 1850	82	Sept. 20, 1853	80	June 26, 1866	80
Mar. 29, 1850	82	Oct. 21, 1853	81	Apr. 26, 1867	82
Aug. 18, 1850	82	July 7, 1854	84	July 5, 1867	83
Sept. 18, 1850	80	July 7, 1855	88	July 6, 1867	93
Apr. 27, 1851	80	Sept. 26, 1855	84	July 7, 1867	90
Apr. 28, 1851	85	Sept. 5, 1856	80	Sept. 18, 1867	80
Apr. 29, 1851	81	Sept. 17, 1856	80	Sept. 19, 1867	82
Aug. 18, 1851	82	Sept. 18, 1856	81	Sept. 20, 1867	83
Aug. 19, 1851	81	June 16, 1857	88	Sept. 21, 1867	83
Oct. 18, 1851	86	Sept. 27, 1857	84	Oct. 7, 1868	80
Mar. 22, 1852	81	Sept. 28, 1857	80	Sept. 24, 1869	81
Mar. 23, 1852	80	Sept. 29, 1858	80	Sept. 25, 1869	82
Apr. 17, 1852	80	Sept. 30, 1858	87	Sept. 26, 1869	81
Apr. 18, 1852	84	Oct. 1, 1859	82	May 6, 1870	84
July 29, 1852	80	Oct. 2, 1859	80	May 7, 1870	86
Sept. 1, 1852	80	Apr. 26, 1860	81	July 1, 1870	82
Sept. 9, 1852	84	Sept. 15, 1860	85	July 2, 1870	86
Sept. 10, 1852	94	Sept. 17, 1860	80	Aug. 2, 1870	80
Sept. 11, 1852	94	Oct. 2, 1864	80	Oct. 5, 1870	80
Sept. 16, 1852	85	Oct. 3, 1864	81	Oct. 6, 1870	83
Sept. 17, 1852	85	May 5, 1865	84	Oct. 2, 1871	80

*Minimum temperatures.*

	°F.		°F.		°F.
Nov. 21, 1849	30	Feb. 9, 1857	32	Mar. 30, 1862	31
Nov. 27, 1849	32	Jan. 7, 1858	31	Mar. 31, 1862	32
Nov. 28, 1849	28	Jan. 14, 1858	32	Apr. 2, 1862	32
Dec. 4, 1849	30	Feb. 9, 1858	32	May 11, 1862	32
Dec. 5, 1849	31	Mar. 18, 1858	32	Dec. 4, 1862	32
Dec. 7, 1849	31	Dec. 3, 1858	32	Dec. 15, 1862	32
Dec. 9, 1849	32	Dec. 7, 1858	28	Dec. 27, 1862	31
Dec. 10, 1849	32	Dec. 8, 1858	29	Dec. 29, 1862	32
Dec. 13, 1849	29	Dec. 9, 1858	32	Dec. 30, 1862	32
Jan. 13, 1850	31	Jan. 7, 1859	32	Jan. 12, 1863	32
Jan. 14, 1850	32	Jan. 9, 1859	29	Jan. 17, 1863	32
Jan. 19, 1850	32	Jan. 10, 1859	28	Feb. 9, 1863	32
Mar. 4, 1850	30	Jan. 11, 1859	29	Jan. 28, 1864	32
Nov. 11, 1850	30	Jan. 12, 1859	30	Dec. 19, 1865	31
Dec. 5, 1850	29	Dec. 22, 1859	32	Dec. 28, 1867	20
Dec. 6, 1850	30	Jan. 18, 1861	32	Jan. 7, 1868	30
Jan. 17, 1851	30	Jan. 3, 1862	32	Jan. 8, 1868	30
Mar. 20, 1851	30	Jan. 4, 1862	26	Jan. 11, 1868	32
Mar. 21, 1851	32	Jan. 24, 1862	32	Jan. 12, 1868	31
Jan. 19, 1854	31	Jan. 25, 1862	32	Jan. 17, 1868	31
Jan. 20, 1854	25	Jan. 26, 1862	29	Jan. 19, 1868	27
Jan. 21, 1854	31	Jan. 27, 1862	29	Jan. 22, 1868	30
Dec. 24, 1855	29	Jan. 28, 1862	22	Dec. 19, 1869	31
Dec. 25, 1855	32	Jan. 29, 1862	27	Dec. 21, 1869	30
Dec. 28, 1855	28	Jan. 31, 1862	25	Dec. 22, 1869	28
Dec. 29, 1855	29	Feb. 1, 1862	29	Dec. 16, 1870	32
Dec. 30, 1855	30	Feb. 2, 1862	29	Dec. 18, 1870	28
Dec. 31, 1855	30	Feb. 3, 1862	32	Dec. 19, 1870	31
Jan. 1, 1856	30	Feb. 4, 1862	32	Dec. 20, 1870	26
Dec. 30, 1856	31	Feb. 7, 1862	31	Dec. 21, 1870	32
Jan. 8, 1857	29	Feb. 8, 1862	32	Dec. 22, 1870	29
Jan. 9, 1857	32	Feb. 20, 1862	32	Dec. 24, 1870	28
Feb. 7, 1857	30	Mar. 9, 1862	31		

## NOTES FROM THE RECORD OF G. H. GIBBONS, M D

1847.

[From the California Star, San Francisco]

*January 19* —Ice nearly one-fourth inch thick—the first of the season, said to be a cold winter*February 19* —Heavy rains still continue at regular intervals of four to eight days Already more rain this season than in last three years*April 3* —A number of heavy rains in last six days. Dry weather for four or five weeks preceding Dry weather appears to have followed*May 8*.—During the past week a succession of showers, sufficient to moisten the earth—the annual “May rains,” none to come after San Joaquin country flooded, unusual amount of rain on the mountains in winter*May 22* —Several light showers during past week*July 2*.—A light but refreshing shower, barely sufficient to render the dust adhesive, a promise of more.*August 21* —Cold winds and heavy fogs throughout the week*August 28* —A heavy shower of rain in evening, with thunder and lightning, extending some miles back*September 18* —A week of hot and calm weather, 92° in shade*September 25*.—Sou'westers, sea fogs, etc ; “cool to overcoating” this week*October 20* —A furious norther, lasting till evening*October 30*.—Weather dubious, inclining to “heavy wet”*November 6* —Winter fairly closed in The past week cold and disagreeable, with drenching rains and cold winds For a few days no locomotion allowed.

1848

*February 26* —Rain fell abundantly the past week, and snow on the mountains.*March 18*.—Heavy rains during the week Several weeks preceding the weather was delightful, 63°.*April 1* —Rains have been abundant

1849.

[San Francisco Whig of September 3, 1852]

*September 19*.—Thunderstorm on Mokelumne River

[From the Alta-California, April 17, 1850]

The first southeast blow was on November 13 and the last in March, 7 southeast blows in that period, and seventy-one days rain in those one hundred and thirty-nine days. Mean barometer 29.12; temperature 57°

1850.

[From the San Francisco Herald]

*September 10* —Heavy rain above Marysville*September 11*.—Shower at Marysville*September 12* —First rain of season, light shower at 6 a. m. at San Francisco.*September 15* —Gentle rain most of day at San Francisco*September 20* —Shower last night*September 20 and 22* —Rain on Tuolumne, great flood*September 21* —Moist and hazy. Much rain during day.*September 22*.—Bright and warm*September 23*.—Rain at 2 p. m. and all the evening*October* —No rain noted during month.*November 19* —Rain at times, began in morning, slight showers frequent through the day and night Severe gale from southeast in p. m., blew down Presbyterian church on Stockton street and damaged shipping*November 22*.—Rain storm. Price of carting raised from \$1 and \$1.50 to \$2 and \$2.50 from mud.*November 23* —Calaboose inundated 1 foot during night.

## CLIMATE OF NORTH AND CENTRAL COAST.

43

The tables of monthly and seasonal rainfalls for San Francisco are given on page 9.

TOTAL NUMBER OF DAYS ON WHICH PRECIPITATION HAS FALLEN FROM MARCH 1, 1871, TO MARCH 1, 1901.

Month.	Less than 0.01.	0.01-0.10.	0.11-0.25.	0.26-0.50.	0.51-1.00.	Over 1.00.
January .....	43	113	65	56	61	37
February .....	27	125	56	54	48	19
March .....	45	129	63	50	45	17
April .....	50	101	44	34	16	16
May .....	52	74	24	10	12	8
June .....	34	40	6	5	3	0
July .....	15	16	1	0	0	0
August .....	22	13	0	0	0	0
September .....	27	32	11	7	5	0
October .....	25	62	22	18	17	12
November .....	31	77	47	35	22	25
December .....	31	17	58	71	49	38

NUMBER OF HIGH WINDS, SEPTEMBER, 1881, TO DECEMBER 31, 1900.<sup>a</sup>

Month.	Velocity.			Month.	Velocity.		
	30 to 35.	36 to 40.	Over 40.		30 to 35.	36 to 40.	Over 40.
January .....	20	16	8	July .....	188	56	2
February .....	21	7	1	August .....	157	35	2
March .....	41	11	2	September .....	107	7	1
April .....	82	14	2	October .....	85		1
May .....	121	15	2	November .....	11		6
June .....	196	35	8	December .....	24	7	4

Record commencing September 1, 1881.

<sup>a</sup> All wind velocities are given in miles per hour.

## HIGHEST WIND VELOCITY, DIRECTION, AND DATE FOR EACH MONTH TO DECEMBER 31, 1900.

Month.	Velocity.	Direction.	Date.	Month.	Velocity.	Direction.	Date.
January .....	48	SW.	26, 1875	July .....	41	W.	515, 1898
February .....	48	SW.	22, 1891	August .....	42	SW.	2, 1898
March .....	44	N.	8, 1880	September .....	40	W.	27, 1899
April .....	47	NW.	23, 1871	October .....	41	W.	10, 1899
May .....	45	W.	11, 1897	November .....	56	SE.	30, 1892
June .....	48	SW.	30, 1873	December .....	60	SE.	23, 1892

<sup>a</sup> Cups blew off before maximum was reached.

<sup>b</sup> Also other dates.

## AVERAGE VELOCITY OF AFTERNOON WINDS.

Month.	2 to 3.	3 to 4.	4 to 5.	Month.	2 to 3.	3 to 4.	4 to 5.
January .....	8.8	8.6	8.0	July .....	21.0	21.6	22.0
February .....	10.5	10.8	10.8	August .....	20.2	20.9	20.8
March .....	13.4	14.1	14.1	September .....	17.7	18.5	18.4
April .....	16.7	17.3	16.9	October .....	18.4	14.0	14.1
May .....	18.0	18.5	18.1	November .....	9.2	9.4	9.6
June .....	20.8	21.3	21.0	December .....	8.4	8.1	7.7

## GREATEST PRECIPITATION (INCHES AND HUNDREDTHS) IN TWENTY-FOUR HOURS FOR EACH MONTH

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Greatest annual
1871.....	---	---	0 57	1 28	0 13	0 01	0 00	0 02	0 00	0 07	1 24	3 14	3 14
1872.....	2 36	1 28	0 73	0 35	0 15	0 03	0 01	0 00	0 04	0 11	2 06	2 33	2 36
1873.....	1 02	0 82	0 54	0 36	0 00	0 01	0 01	0 05	0 00	0 77	0 80	2 33	2 33
1874.....	1 61	0 81	0 65	0 70	0 23	0 13	0 00	0 00	0 02	1 58	3 98	0 15	3 98
1875.....	2 19	0 27	0 45	0 06	0 14	0 90	0 00	0 00	0 00	0 22	2 37	1 50	2 37
1876.....	1 76	1 80	1 59	0 60	0 24	0 04	0 01	0 01	0 20	1 39	0 19	0 00	1 80
1877.....	1 63	0 52	0 56	0 08	0 18	0 01	0 02	0 00	0 00	0 36	0 56	1 11	1 63
1878.....	1 98	1 92	1 01	0 61	0 14	0 01	0 01	T	0 45	1 27	0 45	0 33	1 98
1879.....	1 04	1 66	3 31	0 72	0 93	0 05	0 01	0 02	T	0 56	1 38	1 55	3 31
1880.....	1 03	0 64	0 57	2 21	0 84	0 00	0 00	0 00	0 00	0 05	0 32	2 36	2 36
1881.....	4 67	1 37	0 69	1 09	0 17	0 41	0 00	0 00	0 25	0 21	1 34	1 35	4 67
1882.....	0 57	0 82	0 86	0 44	0 15	0 02	0 00	0 00	0 26	1 40	2 41	0 76	2 41
1883.....	1 30	0 71	1 63	0 76	1 23	0 01	0 00	0 00	0 42	1 19	1 01	0 28	1 63
1884.....	1 44	1 52	2 21	1 66	0 12	1 23	0 00	0 03	0 21	1 15	0 19	2 07	2 21
1885.....	0 97	0 15	0 55	2 03	0 04	0 10	0 05	T	0 11	0 70	2 58	2 78	2 78
1886.....	2 40	0 18	0 65	1 36	0 21	0 01	0 23	0 00	0 01	0 72	0 77	1 10	2 40
1887.....	0 80	3 60	0 52	1 45	0 03	0 07	T	0 01	0 18	0 00	0 48	1 14	3 60
1888.....	1 58	0 38	1 34	0 11	0 19	0 10	0 01	0 01	0 92	0 05	1 68	1 51	1 68
1889.....	0 81	0 59	3 08	0 30	1 29	0 03	0 01	T	T	2 03	0 92	1 46	3 08
1890.....	2 08	1 63	1 86	0 55	0 53	0 05	0 02	0 00	0 31	0 00	0 00	1 90	2 08
1891.....	0 75	3 38	0 68	1 20	0 61	0 10	0 09	0 02	0 63	0 03	0 26	2 21	3 38
1892.....	1 06	1 03	0 90	0 38	1 15	T	0 00	0 00	0 02	0 91	1 46	2 34	2 34
1893.....	1 39	1 06	0 98	0 71	0 14	0 03	0 02	0 00	0 12	0 10	1 69	0 97	1 69
1894.....	2 61	1 05	0 34	0 30	0 68	0 22	T	0 00	1 04	0 64	0 88	1 64	2 61
1895.....	1 96	1 44	0 67	0 89	0 27	0 00	0 01	0 00	0 62	0 06	1 06	0 51	1 96
1896.....	1 85	0 18	0 84	2 43	0 34	0 00	0 04	0 06	0 41	1 46	2 79	1 65	2 79
1897.....	1 08	1 23	1 42	0 20	0 61	0 19	T	T	0 08	1 41	0 42	1 02	1 42
1898.....	0 33	0 78	0 13	0 19	1 23	0 18	0 00	T	0 73	0 45	0 36	0 70	1 23
1899.....	0 98	0 08	2 15	0 45	0 77	0 01	0 00	T	0 00	1 94	1 51	1 17	2 15
1900.....	1 02	0 50	0 90	0 36	0 22	0 04	T	T	0 45	0 34	1 66	0 74	1 92
1901.....	1 75	1 95	0 67	0 83	0 46	T	---	---	---	---	---	---	---
Greatest... {	4 67	3 60	3 31	2 43	1 29	1 23	0 23	0 06	1 04	2 03	3 98	3 14	...
date... {	29, 1881	4-5, 1887	4-5, 1879	23-24, 1896	4-5, 1889	11-12, 1884	16, 1886	29-30, 1896	29-30, 1894	17-18, 1889	23, 1874	18-19, 1871	...

## DATES WHEN PRECIPITATION EQUALED OR EXCEEDED 2 50 INCHES IN ANY CONSECUTIVE TWENTY-FOUR HOURS.

	Inches
December 17 and 18, 1871, from 11 43 p. m. 17th to 11 43 p. m. 18th.....	2 83
December 18 and 19, 1871, from 11 43 p. m. 18th to 11 43 p. m. 19th.....	3 12
November 22 and 23, 1874, from 11 08 p. m. 22d to 11 08 p. m. 23d.....	3 98
March 4 and 5, 1879, from 4 43 p. m. 4th to 4 43 p. m. 5th.....	3 31
January 28 and 29, 1881, from 11 08 p. m. 28th to 11 08 p. m. 29th.....	4 67
November 23 and 24, 1885, from 11 p. m. 23d to 11 p. m. 24th.....	2 58
December 21, 1885, from 1 35 a. m. 21st to 1 35 p. m. 21st.....	2 78
February 4 and 5, 1887, from 3 p. m. 4th to 3 p. m. 5th.....	3 60
March 12 and 13, 1889, from 8 15 a. m. 12th to 8 a. m. 13th.....	3 08
February 14 and 15, 1891, from 8 45 p. m. 14th to 8 p. m. 15th.....	3 38
January 19 and 20, 1894, from 8 p. m. 19th to 8 p. m. 20th.....	2 61
November 23 and 24, 1896, 6 a. m. 23d to 6 a. m. 24th.....	2 79

Maximum rates of rainfall January 1, 1893, to December 31, 1900 Five minutes, 0 16, 10 minutes, 0 19, 1 hour, 0 55 On February 22, 1901 Five minutes, 0 17, 10 minutes, 0 21. On October 23, 1902. Five minutes, 0 16, 10 minutes, 0 20 On February 7, 1903 Five minutes, 0 19, 10 minutes, 0 23

## GREATEST MONTHLY PRECIPITATION AND DATE.

Month	Year	Amount	Month	Year.	Amount
January.....	1862	24 36	July.....	1886	0 23
February.....	1878	12 52	August.....	1864	0 21
March.....	1879	8 75	September.....	1898	1 06
April.....	1880	10 06	October.....	1889	7 28
May.....	1883	3 52	November.....	1885	11 78
June.....	1884	2 57	December.....	1866	15 16



## LEAST MONTHLY PRECIPITATION AND DATE.

Month.	Year.	Amount.	Month.	Year.	Amount.
January.....	1852	0.58	July.....	(a)	0.00
February.....	1864	0.00	August.....	(a)	0.00
March.....	1898	0.24	September.....	(a)	0.00
April.....	1857	0.00	October.....	(a)	0.00
May.....	(a)	0.00	November.....	1890	0.00
June.....	(a)	0.00	December.....	1876	0.00

(a) Many years.

## NUMBER OF TIMES MONTHLY PRECIPITATION HAS EXCEEDED THE NORMAL FOR FIFTY YEARS.

Month.	Total.	First 25 years.	Second 25 years.	Month.	Total.	First 25 years.	Second 25 years.
January.....	19	9	10	July.....	6	2	4
February.....	22	13	9	August.....	7	5	2
March.....	20	10	10	September.....	18	4	14
April.....	18	9	9	October.....	16	5	11
May.....	18	8	10	November.....	23	15	8
June.....	9	1	8	December.....	20	13	7

## AVERAGE HOURLY WIND VELOCITY (MILES PER HOUR).

	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1 a.m.....	6.1	6.1	6.7	7.3	7.9	9.3	9.2	8.9	6.8	5.3	5.2	6.1
2 a.m.....	6.2	5.9	6.3	7.0	7.6	8.8	8.8	8.5	6.4	5.0	5.1	6.2
3 a.m.....	6.3	5.8	6.3	6.6	7.2	8.2	8.2	7.9	6.0	4.9	5.2	6.2
4 a.m.....	6.3	5.9	6.2	6.3	6.8	7.6	7.8	7.6	5.9	4.8	5.1	6.3
5 a.m.....	6.4	6.1	6.3	6.1	6.6	7.1	7.4	7.3	5.6	4.8	5.2	6.4
6 a.m.....	6.5	5.9	6.1	6.0	6.4	6.9	7.4	6.9	5.4	4.7	5.3	6.5
7 a.m.....	6.4	5.8	6.1	6.2	6.7	7.1	7.4	6.8	5.4	4.7	5.1	6.6
8 a.m.....	6.5	6.2	6.6	7.0	7.5	8.1	8.0	7.4	5.8	5.0	5.5	6.8
9 a.m.....	7.0	6.9	7.3	7.8	8.3	8.8	8.6	7.8	6.4	5.6	6.1	7.1
10 a.m.....	7.6	7.6	8.0	8.6	9.3	10.3	9.9	8.9	7.0	6.2	6.6	7.7
11 a.m.....	7.9	7.6	8.4	9.7	11.0	12.4	11.8	11.1	8.3	6.7	6.7	7.8
12 noon.....	8.2	7.8	9.2	11.6	13.3	15.2	14.7	13.3	10.7	8.1	6.8	7.9
1 p.m.....	8.4	8.6	10.6	13.9	15.4	17.8	17.4	16.0	13.3	9.9	7.4	8.2
2 p.m.....	8.7	9.6	12.2	15.6	17.0	19.8	19.7	18.5	15.7	11.8	8.6	8.5
3 p.m.....	8.8	10.5	13.4	16.7	18.0	20.8	21.0	20.2	17.7	13.4	9.2	8.4
4 p.m.....	8.6	10.8	14.1	17.3	18.5	21.3	21.6	20.9	18.5	14.0	9.4	8.1
5 p.m.....	8.0	10.8	14.1	16.9	18.1	21.0	22.0	20.8	18.4	14.1	9.6	7.7
6 p.m.....	7.6	9.8	13.1	15.9	17.1	20.1	20.7	19.9	17.0	13.2	8.8	7.6
7 p.m.....	7.3	9.0	11.6	14.3	15.2	18.2	18.7	17.5	14.8	11.0	7.7	7.0
8 p.m.....	6.8	8.3	9.9	12.3	13.1	16.1	16.2	15.2	12.0	9.0	6.7	6.7
9 p.m.....	6.5	7.4	8.6	10.6	11.3	13.5	14.0	13.3	10.0	7.7	6.1	6.6
10 p.m.....	6.1	7.0	7.8	9.5	10.0	11.8	12.3	11.3	9.0	6.6	5.6	6.4
11 p.m.....	5.9	6.4	7.2	8.6	9.0	10.8	10.8	10.2	8.2	6.0	5.2	6.2
12 midnight.....	6.0	6.1	6.8	7.8	8.3	10.1	10.0	9.4	7.4	5.6	5.1	6.0
Average.....	7.0	7.6	8.8	10.4	11.3	13.0	13.1	12.3	10.1	7.8	6.0	7.0

## CLIMATOLOGY OF CALIFORNIA.

## MONTHLY RELATIVE HUMIDITY (PER CENT).

Month	A M	P M	Average	Month	A M	P M	Average
January	83	75	79	July	89	80	84
February	83	73	78	August	90	82	86
March	82	73	78	September	88	78	83
April	88	74	78	October	85	74	80
May	84	74	79	November	82	71	76
June	86	75	80	December	84	76	80

## DATES OF SNOWFALL IN SAN FRANCISCO SINCE MARCH 1, 1871

*January 21, 1876* —Light snow fell for ten minutes

*December 31, 1882* —Heavy snow fell from 11 30 a m to 4 20 p m , amount, 3.5 inches

*February 6, 1883* —A few flakes of snow fell during the day

*February 7, 1884* —Snow fell at intervals during the day, depth varying from 1 to 2 inches

*February 5, 1887* —Snow fell during the day; depth at office, 3 7 inches, while in the western portion of the city it was fully 7 inches deep.

*January 4, 1888* —A few flakes of snow fell during the day

*January 16, 1888* —Light snow fell to the depth of 0 1 inch.

*March 2, 1894* —A few flakes of snow fell during the day.

*March 2, 1896* —Snow mixed with rain fell at intervals during the day

*March 3, 1896* —Heavy snow fell during the night; depth at office at 8 a. m , 1 inch.

*February 3, 1903* —Snow and rain, large flakes, 11 16 to 11 20 a m.

## THE GREAT RAINSTORM OF 1866.

Mr. L. J. Le Conte, C. E., of Oakland, has kindly furnished the following relative to the great rainstorm in this city on the 19th and 20th of December, 1866:

Our profession is interested in maximum rainfall in twenty-four hours. I inclose a copy of the record of the memorable rainfall of December 19 and 20, 1866, which is given in hourly subdivisions. The monthly rainfall was also the maximum on record—15 16 inches—while at Sacramento the record was 12.90 inches. I think this was published in full in the Evening Bulletin in December, 1885.

Following is the record referred to:

Inches	Inches
December 19—11 45 a m to 4 45 p m ..... 1 97	December 20—1 a. m to 8.15 a m ..... 1 47
December 19—4 45 p m to 7 45 p. m ..... 2 27	
December 19—7.45 p. m to 9 50 p m ..... 0 85	Total in 21 hours ..... 7 76
December 19—9 50 p m to 1 a m ..... 1 20	

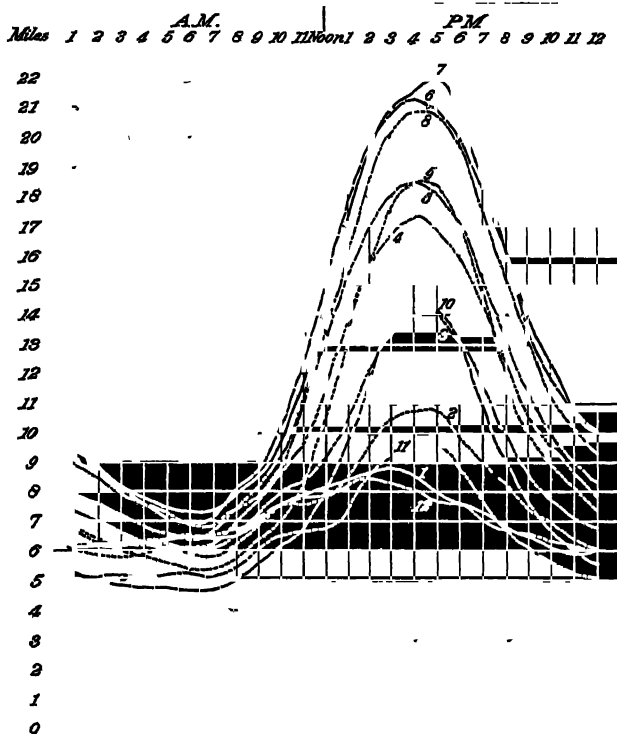


FIG. 6.—Monthly curves of hourly wind velocities

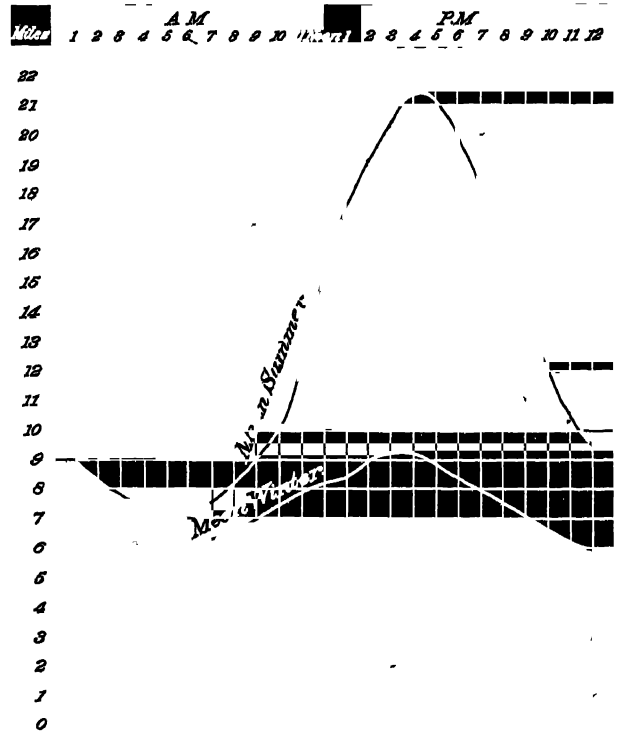


FIG. 7.—Hourly wind velocities at San Francisco



FIG. 8.—Mean relative humidity—upper, 5 a. m., lower, 5 p. m

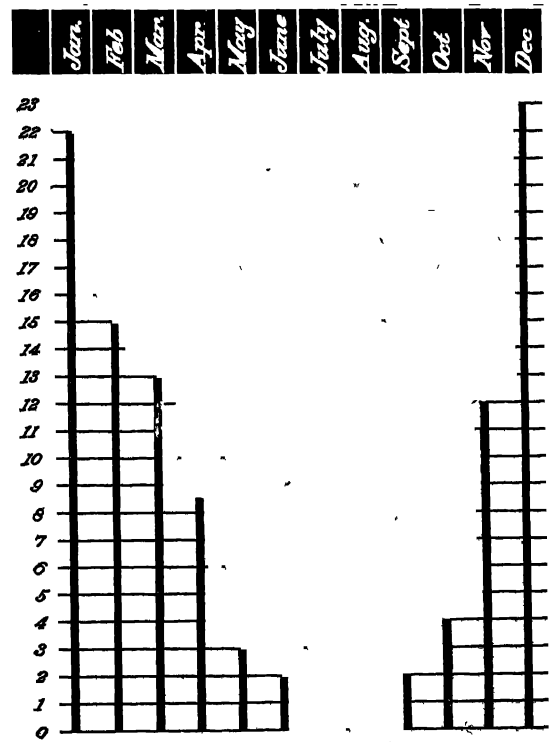


FIG. 9.—Percentage annual rainfall each month.—From Bulletin D, by A. J. Henry.

RAINFALL (INCHES AND HUNDREDTHS) AS MEASURED BY JOHN PETTEE, JANUARY 1, 1865, TO MARCH 19, 1902

[In this record the day commences at about 7 a m on the date mentioned and ends on the succeeding day at about 7 a m ]

Date	Amount	Date	Amount	Date	Amount	Date	Amount	Date	Amount.
<i>Rain year</i> 1864-65 a		<i>Rain year</i> 1864-65		<i>Rain year</i> 1866-67		<i>Rain year</i> 1866-67		<i>Rain year</i> 1867-68	
1865		1866		1866		1867		1868	
January 1.....	0 04	January 5 . . .	0 32	November 2 . .	0 28	February 27 . .	1 02	January 13 . .	0 05
January 5 . . .	0 08	January 6 . . .	0 24	November 3 . .	0 05	February 28 . .	0 60	January 17 . .	0 53
January 18.....	0 02	January 7 . . .	1 32	November 4 . .	0 35	March 1 . . . .	0 21	January 19 . .	1 07
January 24.....	0 04	January 8 . . .	0 58	November 6 . .	0 01	March 8 . . . .	0 42	January 20 . .	0 04
January 25 . .	0 88	January 10 . . .	1 08	November 7 . .	0 11	March 16 . . . .	0 02	January 21 . .	0 50
January 26 . .	0 22	January 11 . . .	0 59	November 16 . .	0 31	March 17 . . . .	0 09	January 22 . .	1 00
January 27 . .	1 07	January 12 . . .	0 05	November 19 . .	0 06	March 20 . . . .	0 06	January 23 . .	0 81
January 28 . .	0 97	January 13 . . .	0 80	November 23 . .	0 16	March 21 . . . .	0 26	January 24 . .	0 82
January 30 . .	0 10	January 16 . . .	1 35	November 24 . .	0 53	March 31 . . . .	0 92	January 25 . .	0 77
January 31 . .	1 41	January 17 . . .	0 74	November 25 . .	0 43	April 4 . . . . .	0 22	January 26 . .	0 87
February 1 . . .	0 01	January 18.....	0 01	November 29 . .	0 60	April 5 . . . . .	0 26	February 7 . . .	0 08
February 11 . .	0 02	January 19 . . .	0 35	November 30 . .	0 17	April 9 . . . . .	0 04	February 19 . .	0 24
February 13 . .	0 35	January 20 . . .	3 08	December 1 . . .	0 70	April 10 . . . . .	0 70	February 20 . . .	0 54
February 14 . .	0 07	January 21 . . .	0 52	December 2 . . .	0 13	April 11 . . . . .	0 53	February 21 . . .	0 33
February 15 . .	0 05	January 22 . . .	0 06	December 3 . . .	0 12	April 12 . . . . .	0 01	February 22 . . .	0 11
February 16 . .	0 11	January 23 . . .	0 12	December 10 . .	0 13	May 17 . . . . .	0 04	February 23 . . .	0 02
February 17 . .	0 04	January 24 . . .	0 13	December 11 . .	0 59	May 24 . . . . .	0 01	February 24 . . .	1 43
February 18 . .	0 53	January 31 . . .	0 27	December 12 . .	0 01	Total . . . . .	85 94	February 25 . . .	0 31
February 19 . .	0 08	February 1 . . . .	0 05	December 14 . .	0 02	<i>Rain year</i> 1867-68		February 26 . . .	2 41
February 21 . .	0 03	February 2 . . . .	0 55	December 15 . .	1 03	1867		February 27 . . .	0 21
February 27 . .	0 04	February 3 . . . .	0 14	December 16 . .	0 10	September 14 . .	0 06	February 28 . . .	0 18
February 28 . .	0 04	February 5 . . . .	0 13	December 17 . .	0 16	October 5 . . . .	0 56	February 29 . . .	0 88
March 1 . . . . .	0 26	February 9 . . . .	0 06	December 18 . .	2 41	November 5 . . . .	0 44	March 1 . . . . .	0 09
March 3 . . . . .	0 34	February 10 . . .	0 01	December 19 . .	0 14	November 6 . . . .	0 50	March 2 . . . . .	0 11
March 4 . . . . .	0 05	February 12 . . .	0 04	December 20 . .	7 67	November 18 . . .	0 28	March 3 . . . . .	1 39
March 11 . . . .	0 04	February 26 . . .	0 05	December 21 . . .	0 67	November 19 . . .	0 61	March 4 . . . . .	0 17
March 12 . . . .	0 03	February 27 . . .	0 04	December 23 . . .	0 13	November 20 . . .	0 01	March 11 . . . . .	0 22
March 19 . . . . .	0 11	February 28 . . .	0 31	December 24 . .	0 08	November 21 . . .	0 73	March 12 . . . . .	0 04
April 6 . . . . .	0 22	March 1 . . . . .	0 02	December 25 . .	0 04	November 23 . . .	0 37	March 13 . . . . .	0 67
April 7 . . . . .	0 49	March 4 . . . . .	0 04	December 26 . .	0 78	November 24 . . .	0 17	March 14 . . . . .	0 11
April 8 . . . . .	0 09	March 5 . . . . .	0 10	December 27 . .	0 10	November 25 . . .	0 03	March 15 . . . . .	0 22
April 27 . . . . .	0 01	March 6 . . . . .	0 46	December 28 . . .	0 41	November 26 . . .	0 02	March 16 . . . . .	0 07
May 17 . . . . .	0 29	March 7 . . . . .	0 85	December 29 . . .	0 28	November 30 . . .	0 02	March 20 . . . . .	0 98
May 18 . . . . .	0 33	March 8 . . . . .	0 04	December 30 . . .	0 20	December 1 . . . .	0 17	March 21 . . . . .	1 02
July 16 . . . . .	0 01	March 17 . . . .	0 01			December 7 . . . .	0 30	March 22 . . . . .	0 02
September 24 . .	0 10	March 18 . . . .	0 67	1867		December 8 . . . .	0 03	April 1 . . . . .	0 03
September 26 . .	0 13	March 19 . . . .	0 01	January 2 . . . .	0 01	December 9 . . . .	0 36	April 2 . . . . .	0 12
October 7 . . . . .	0 03	March 20 . . . .	0 22	January 4 . . . .	0 39	December 12 . . .	0 02	April 3 . . . . .	0 14
October 8 . . . .	0 11	March 21 . . . .	0 01	January 5 . . . . .	0 64	December 15 . . .	0 10	April 6 . . . . .	0 45
October 24 . . . .	0 03	March 22 . . . .	0 02	January 10 . . . .	0 02	December 16 . . .	0 54	April 9 . . . . .	0 21
October 29 . . . .	0 17	March 23 . . . .	0 01	January 11 . . . .	0 24	December 17 . . .	1 75	April 10 . . . . .	0 86
October 30 . . . .	0 01	March 24 . . . .	0 08	January 12 . . . .	0 75	December 18 . . .	0 73	April 11 . . . . .	0 10
November 13 . . .	0 95	March 25 . . . .	0 12	January 14 . . . .	0 04	December 19 . . .	0 80	April 13 . . . . .	0 01
November 14 . . .	0 03	March 26 . . . .	0 07	January 18 . . . .	0 08	December 20 . . .	1 21	April 14 . . . . .	0 14
November 16 . . .	0 83	March 29 . . . .	0 10	January 19 . . . .	0 34	December 21 . . .	2 03	April 29 . . . . .	0 08
November 17 . . .	0 09	March 30 . . . .	0 44	January 20 . . . .	0 46	December 22 . . .	0 72	April 30 . . . . .	0 02
November 18 . . .	0 15	April 14 . . . . .	0 03	January 21 . . . .	1 14	December 23 . . .	0 83	May 12 . . . . .	0 02
November 19 . . .	0 07	April 18 . . . . .	0 01	January 22 . . . .	0 34	December 24 . . .	0 63	May 13 . . . . .	0 01
November 20 . . .	0 74	April 29 . . . . .	0 15	January 23 . . . .	0 70	December 25 . . .	0 11	May 18 . . . . .	0 01
November 21 . . .	0 19	April 30 . . . . .	0 02	January 24 . . . .	0 04	December 26 . . .	0 68	June 12 . . . . .	0 01
November 22 . . .	1 07	May 12 . . . . .	0 01	January 25 . . . .	0 17	December 29 . . .	2 40	June 22 . . . . .	0 10
November 30 . . .	0 47	May 17 . . . . .	0 01	January 26 . . . .	1 08	December 30 . . .		June 23 . . . . .	0 06
December 1 . . . .	0 02	May 21 . . . . .	0 19	January 29 . . . .	0 26	December 31 . . .		Total . . . . .	40 62
December 7 . . . .	0 05	May 22 . . . . .	0 10	February 2 . . . .	0 02	1868			
December 9 . . . .	0 01	May 25 . . . . .	0 95	February 9 . . . .	0 01	January 1 . . . . .	0 47	<i>Rain year</i> 1868-69	
December 13 . . .	0 01	May 26 . . . . .	0 10	February 18 . . .	0 56	January 2 . . . . .	0 05	1868	
December 21 . . .	0 04	May 27 . . . . .	0 31	February 19 . . .	0 65	January 3 . . . . .	0 14		
December 23 . . .	0 30	June 8 . . . . .	0 13	February 20 . . .	1 74	January 4 . . . . .	0 13	September 30 . .	0 12
December 24 . . .	0 09	June 21 . . . . .	0 01	February 21 . . .	1 76	January 8 . . . . .	0 58	October 1 . . . . .	0 08
December 25 . . .	0 08	Total . . . . .	23 57	February 25 . . .	0 14	January 11 . . . .	0 90	October 2 . . . . .	0 02
December 26 . . .	0 01			February 26 . . .	0 04	January 12 . . . .	0 49	October 22 . . . .	0 02

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RAINFALL (INCHES AND HUNDREDTHS) AS MEASURED BY JOHN PETTEE, JANUARY 1, 1865, TO MARCH 19, 1902—Cont'd.

Date.	Amount.	Date.	Amount.	Date.	Amount.	Date.	Amount.	Date.	Amount.
<i>Rain year</i> 1868-69.		<i>Rain year</i> 1869-70.		<i>Rain year</i> 1870-71.		<i>Rain year</i> 1871-72.		<i>Rain year</i> 1871-72.	
1868.		1869.		1870.		1871.		1872.	
November 4 ...	0.06	July 10 .....	0.07	September 29 ..	0.04	August 5 .....	0.02	February 27 ...	0.73
November 18 ..	0.64	September 2 ...	0.09	September 30 ..	0.02	September 16 ..	0.04	February 29 ...	0.15
November 19 ..	0.39	October 18 .....	0.05	November 4 ...	0.02	October 27 .....	0.13	March 4 .....	0.49
November 24 ...	0.19	October 19 .....	0.64	November 6 ...	0.20	November 3 ...	0.09	March 5 .....	0.09
November 29 ...	0.07	October 20 .....	1.07	November 7 ...	0.12	November 12 ...	0.02	March 8 .....	0.85
December 17 ...	0.50	October 21 .....	0.58	November 8 ...	0.01	November 14 ...	0.15	March 10 .....	0.25
December 19 ...	0.01	November 5 ...	0.15	November 9 ...	0.03	November 15 ...	0.08	March 11 .....	0.17
December 21 ...	0.11	November 10 ...	0.81	November 26 ...	0.03	November 24 ...	0.29	March 23 .....	0.01
December 22 ...	0.14	November 11 ...	0.15	November 29 ...	0.08	November 25 ...	0.06	March 26 .....	0.08
December 23 ...	1.32	November 12 ...	0.04	December 1 ...	0.63	November 26 ...	0.81	March 30 .....	0.09
December 24 ...	0.12	November 27 ...	0.09	December 2 ...	0.40	November 27 ...	0.11	April 12 .....	0.13
December 25 ...	0.62	December 7 .....	1.23	December 5 ...	1.28	November 28 ...	0.66	April 14 .....	0.85
December 26 ...	0.61	December 8 ...	0.44	December 6 ...	0.31	December 1 ...	0.11	April 15 .....	0.36
December 29 ...	0.15	December 10 ...	0.30	December 7 ...	0.04	December 2 ...	0.01	April 16 .....	0.20
December 30 ...	0.45	December 22 ...	0.38	December 8 ...	0.01	December 17 ...	1.50	April 26 .....	0.18
December 31 ...	0.37	December 23 ...	0.61	December 13 ...	0.17	December 18 ...	2.54	May 31 .....	0.11
1869.		December 24 ...	1.35	December 14 ...	0.20	December 13 ...	1.28	June 4 .....	0.01
January 1 .....	0.86	December 25 ...	0.19			December 20 ...	1.22	Total .....	28.91
January 2 .....	0.20	1870.		1871.		December 21 ...	0.10	<i>Rain year</i> 1872-73.	
January 3 .....	0.01	January 10 ....	0.20	January 9 .....	0.48	December 22 ...	1.57	1872.	
January 7 .....	0.09	January 12 ....	0.21	January 10 ....	0.14	December 23 ...	1.36	September 25 ..	0.04
January 10 ....	0.01	January 13 ....	0.59	January 17 ....	0.54	December 24 ...	0.03	October 25 .....	0.05
January 11 ....	0.05	January 14 ....	1.13	January 18 ....	0.15	December 26 ...	0.20	October 26 .....	0.04
January 13 ....	0.11	January 15 ....	0.03	January 22 ....	0.39	December 27 ...	0.65	November 3 ...	0.20
January 22 ....	0.25	January 17 ....	0.03	January 23 ....	0.24	December 28 ...	0.16	November 4 ...	0.02
January 23 ....	1.50	January 18 ....	0.88	January 27 ....	0.31	December 29 ...	0.62	November 8 ...	0.01
January 25 ....	0.33	January 19 ....	0.13	January 28 ....	0.09	December 30 ...	0.16	November 11 ...	0.49
January 26 ....	0.30	January 20 ....	0.32	February 3 ...	0.01	December 31 ...	1.17	November 12 ...	0.01
January 27 ....	0.02	January 21 ....	0.15	February 4 ...	0.39	1872.		November 23 ...	0.62
January 28 ....	0.62	January 22 ....	0.07	February 6 ...	0.03	January 2 .....	0.56	November 29 ...	1.60
January 29 ....	1.08	January 23 ....	0.02	February 7 ...	0.01	January 3 .....	0.02	December 4 ....	0.04
January 30 ....	0.04	February 9 ....	0.46	February 13 ...	0.30	January 5 .....	0.20	December 22 ...	0.75
February 2 .....	0.63	February 11 ....	0.16	February 14 ...	0.30	January 6 .....	0.09	December 23 ...	0.46
February 3 ...	0.09	February 12 ...	0.02	February 15 ...	0.34	January 7 .....	1.34	December 24 ...	2.81
February 7 ...	0.86	February 14 ...	0.11	February 20 ...	0.86	January 8 .....	1.30	December 25 ...	1.17
February 9 ...	1.82	February 15 ...	0.21	February 21 ...	1.08	January 10 ....	0.07	December 26 ...	0.36
February 10 ...	0.08	February 17 ...	0.02	February 22 ...	0.01	January 11 ....	0.01	December 27 ...	0.94
February 11 ...	0.12	February 19 ...	0.44	February 23 ...	0.22	January 12 ....	0.01	December 28 ...	1.62
March 12 .....	0.07	February 20 ...	0.40	March 5 .....	0.04	January 13 ....	0.01	December 30 ...	0.13
March 13 .....	0.14	February 21 ...	0.23	March 6 .....	0.22	January 30 ....	0.04	1873.	
March 14 .....	0.30	February 22 ...	2.27	March 12 .....	0.14	January 31 ....	0.01	January 1 .....	0.17
March 15 .....	0.05	February 23 ...	0.02	March 14 .....	0.04	February 1 ...	0.01	January 2 .....	0.26
March 16 .....	0.59	February 24 ...	0.11	March 16 .....	0.15	February 2 ...	0.04	January 4 .....	0.12
March 17 .....	0.57	February 28 ...	0.08	March 18 .....	0.07	February 3 ...	0.12	January 5 .....	0.01
March 18 .....	0.08	March 1 .....	0.03	March 19 .....	0.13	February 4 ...	0.01	January 10 ....	0.11
March 19 .....	0.27	March 10 ....	0.06	March 22 .....	0.19	February 7 ...	0.80	January 11 ....	0.06
March 20 .....	0.69	March 11 ....	0.36	March 23 .....	0.25	February 8 ...	1.15	January 12 ...	0.07
March 24 .....	0.03	March 12 .....	0.11	March 24 .....	0.03	February 10 ...	0.49	January 29 ...	0.20
March 25 .....	0.19	March 16 .....	0.94	April 3 .....	0.06	February 11 ...	0.01	January 30 ...	0.30
March 29 .....	0.28	March 17 .....	0.01	April 4 .....	0.68	February 13 ...	0.14	January 31 ...	1.31
April 7 .....	0.31	March 22 .....	0.30	April 5 .....	0.81	February 14 ...	0.01	February 1 ...	0.33
April 16 .....	0.81	March 29 .....	0.03	April 7 .....	0.01	February 15 ...	0.24	February 2 ...	0.22
April 17 .....	0.67	April 2 .....	0.25	April 8 .....	0.06	February 16 ...	0.31	February 3 ...	0.22
April 19 .....	0.12	April 3 .....	0.44	April 16 .....	0.49	February 17 ...	0.10	February 4 ...	0.06
May 17 .....	0.03	April 4 .....	0.01	May 4 .....	0.01	February 18 ...	0.08	February 5 ...	0.02
May 19 .....	0.15	April 7 .....	0.09	May 7 .....	0.01	February 21 ...	0.95	February 8 ...	1.07
May 22 .....	0.07	April 11 .....	0.70	May 15 .....	0.06	February 23 ...	1.30	February 9 ...	0.02
May 23 .....	0.03	May 3 .....	0.14	May 26 .....	0.04	February 24 ...	0.35	February 10 ...	0.32
June 14 .....	0.06	May 18 .....	0.09	May 28 .....	0.19	February 25 ...	0.19		
		May 19 .....	0.13			February 26 ...	0.07		
Total .....	20.56	Total .....	20.22	Total .....	13.10				

RAINFALL (INCHES AND HUNDREDTHS) AS MEASURED BY JOHN PETTEE, JANUARY 1, 1865, TO MARCH 19, 1902—Cont'd.

Date	Amount	Date	Amount	Date	Amount	Date	Amount	Date	Amount
<i>Rain year</i> 1872-73		<i>Rain year</i> 1873-74		<i>Rain year</i> 1874-75		<i>Rain year</i> 1875-76		<i>Rain year</i> 1876-77	
1873.		1874.		1874		1875		1876	
February 12 ..	0 23	January 21 ..	0 14	October 22 ..	0 03	October 31 ..	0 01	March 11 ..	0 05
February 14 ..	0 01	January 25 ..	0 36	October 24 ..	0 59	November 1 ..	0 36	March 12 ..	0 27
February 15 ..	0 28	January 26 ..	0 09	October 25 ..	1 26	November 6 ..	0 20	March 28 ..	0 15
February 16 ..	0 05	January 27 ..	0 22	October 26 ..	0 17	November 10 ..	0 03	March 29 ..	0 06
February 17 ..	1 01	January 28 ..	0 44	October 27 ..	0 01	November 11 ..	0 01	April 3 ..	0 25
February 18 ..	0 03	January 30 ..	0 31	November 3 ..	0 02	November 12 ..	0 34	April 6 ..	0 54
February 23 ..	0 14	February 2 ..	0 29	November 4 ..	0 43	November 13 ..	0 24	April 8 ..	0 03
February 25 ..	0 01	February 6 ..	0 02	November 5 ..	0 98	November 14 ..	0 21	April 9 ..	0 10
February 26 ..	0 68	February 8 ..	0 08	November 7 ..	0 14	November 15 ..	0 11	April 17 ..	0 07
February 27 ..	0 04	February 9 ..	0 01	November 9 ..	0 02	November 16 ..	1 87	April 21 ..	0 06
February 28 ..	0 05	February 10 ..	0 10	November 10 ..	0 02	November 17 ..	1 50	April 28 ..	0 06
March 5 ..	0 48	February 11 ..	0 26	November 12 ..	0 01	November 18 ..	0 26	May 19 ..	0 26
March 6 ..	0 10	February 12 ..	0 19	November 17 ..	0 02	November 20 ..	0 03	May 23 ..	0 01
March 15 ..	0 25	February 13 ..	0 82	November 21 ..	0 10	November 22 ..	0 06	June 19 ..	0 04
March 30 ..	0 02	February 16 ..	0 17	November 22 ..	1 18	November 23 ..	0 18	Total	28 28
April 2 ..	0 12	February 17 ..	0 14	November 23 ..	2 43	November 24 ..	0 04		
April 20 ..	0 30	February 28 ..	0 41	November 24 ..	0 01	November 25 ..	0 01	<i>Rain year</i> 1876-77.	
April 27 ..	0 01	March 1 ..	0 33	November 30 ..	0 05	November 26 ..	1 03	1876	
Total	19 54	March 2 ..	0 21	December 2 ..	0 09	November 29 ..	0 01	July 6 ..	0 02
<i>Rain year</i> 1873-74		March 3 ..	0 08	December 14 ..	0 02	November 30 ..	0 64	August 14 ..	0 01
1873.		March 4 ..	0 06	December 23 ..	0 04	December 1 ..	0 03	September 4 ..	0 19
July 14 ..	0 02	March 5 ..	0 16	December 25 ..	0 11	December 3 ..	0 59	September 29 ..	0 11
July 22 ..	0 01	March 6 ..	0 01	1875		December 18 ..	0 45	October 8 ..	0 02
August 4 ..	0 02	March 7 ..	0 35	January 11 ..	0 01	December 24 ..	0 70	October 15 ..	0 45
October 6 ..	0 14	March 10 ..	0 22	January 13 ..	0 85	December 25 ..	0 02	October 16 ..	0 78
October 7 ..	0 36	March 11 ..	0 75	January 14 ..	0 45	December 26 ..	0 12	October 25 ..	0 07
October 8 ..	0 06	March 12 ..	0 06	January 15 ..	0 01	December 27 ..	0 92	October 26 ..	0 17
November 5 ..	0 35	March 13 ..	0 02	January 16 ..	0 22	December 28 ..	0 25	October 27 ..	1 21
November 12 ..	0 01	March 14 ..	0 64	January 17 ..	1 12	December 31 ..	0 27	October 28 ..	0 22
November 13 ..	0 07	March 15 ..	0 13	January 18 ..	1 35	1876.		November 8 ..	0 08
November 29 ..	0 77	March 25 ..	0 19	January 19 ..	0 52	January 2 ..	1 40	November 16 ..	0 22
November 30 ..	0 05	March 27 ..	0 34	January 20 ..	0 01	January 3 ..	0 55		
December 3 ..	1 93	March 28 ..	0 01	January 21 ..	0 17	January 4 ..	0 09	1877	
December 4 ..	1 09	April 2 ..	0 04	January 22 ..	1 26	January 6 ..	0 95	January 15 ..	0 06
December 5 ..	0 16	April 3 ..	0 01	January 23 ..	0 80	January 7 ..	0 65	January 16 ..	0 46
December 6 ..	0 50	April 4 ..	0 12	January 24 ..	0 09	January 19 ..	0 86	January 17 ..	0 37
December 7 ..	0 14	April 5 ..	0 02	January 25 ..	0 27	January 20 ..	0 17	January 18 ..	0 17
December 8 ..	0 65	April 9 ..	0 06	January 26 ..	0 01	January 21 ..	0 26	January 19 ..	0 18
December 9 ..	0 35	April 10 ..	0 01	February 24 ..	0 01	January 22 ..	0 72	January 20 ..	0 09
December 13 ..	0 30	April 11 ..	0 58	March 1 ..	0 12	January 23 ..	1 37	January 21 ..	0 01
December 14 ..	0 18	April 12 ..	0 05	March 2 ..	0 27	January 24 ..	0 16	January 27 ..	0 86
December 15 ..	0 43	April 29 ..	0 02	March 3 ..	0 25	January 25 ..	0 08	January 28 ..	0 65
December 16 ..	0 11	April 30 ..	0 33	March 5 ..	0 01	January 26 ..	0 42	January 29 ..	0 13
December 18 ..	0 01	May 4 ..	0 03	March 24 ..	0 10	January 27 ..	0 02	January 30 ..	1 10
December 19 ..	0 42	May 5 ..	0 25	March 26 ..	0 01	January 28 ..	0 01	January 31 ..	0 36
December 21 ..	0 37	May 6 ..	0 04	March 27 ..	0 04	January 29 ..	0 02	February 2 ..	0 01
December 27 ..	0 22	May 22 ..	0 05	March 28 ..	0 32	February 4 ..	1 12	February 11 ..	0 28
December 28 ..	0 63	May 23 ..	0 03	April 4 ..	0 09	February 7 ..	0 73	February 12 ..	0 31
December 29 ..	1 44	June 6 ..	0 06	April 29 ..	0 01	February 8 ..	0 05	February 20 ..	0 01
December 30 ..	0 49	June 20 ..	0 01	May 5 ..	0 01	February 9 ..	0 62	February 22 ..	0 06
December 31 ..	0 17	June 21 ..	0 01	May 7 ..	0 07	February 10 ..	0 52	February 25 ..	0 29
1874		Total	24 55	May 14 ..	0 09	February 11 ..	0 31	February 28 ..	0 05
January 1 ..	1 52	<i>Rain year</i> 1874-75		June 12 ..	0 88	February 24 ..	0 03	March 1 ..	0 15
January 2 ..	0 01	1874.		June 13 ..	0 12	February 25 ..	0 55	March 2 ..	0 08
January 14 ..	0 05	September 3 ..	0 05	June 16 ..	0 12	February 26 ..	0 36	March 5 ..	0 14
January 15 ..	0 68	September 30 ..	0 05	Total	18 15	February 27 ..	0 40	March 9 ..	0 56
January 16 ..	0 49	October 1 ..	0 02	<i>Rain year</i> 1875-76		March 1 ..	0 94	March 10 ..	0 07
January 17 ..	0 14	October 8 ..	0 15	1875		March 3 ..	0 61	March 14 ..	0 02
January 18 ..	0 25	October 15 ..	0 03	October 25 ..	0 02	March 5 ..	0 46	March 28 ..	0 02
January 19 ..	0 59	October 18 ..	0 13	October 26 ..	0 18	March 6 ..	1 09	April 2 ..	0 01
January 20 ..	0 04	October 21 ..	0 36	October 27 ..	0 03	March 7 ..	0 38	April 7 ..	0 10
						March 8 ..	0 26	April 14 ..	0 11

## CLIMATE OF NORTH AND CENTRAL COAST.

51

RAINFALL (INCHES AND HUNDREDTHS) AS MEASURED BY JOHN PETTEE, JANUARY 1, 1865, TO MARCH 19, 1902—Cont'd.

Date.	Amount.	Date.	Amount.	Date.	Amount.	Date.	Amount.	Date.	Amount.
<i>Rain year</i> 1876-77.		<i>Rain year</i> 1877-78.		<i>Rain year</i> 1878-79.		<i>Rain year</i> 1879-80.		<i>Rain year</i> 1880-81.	
1877.		1878.		1879.		1879.		1880.	
April 15.....	0.04	February 15 ...	0.34	January 22 ....	0.43	November 13 ..	0.49	April 21.....	0.36
April 18.....	0.02	February 16 ...	0.16	January 23 ....	0.79	November 28 ..	0.55	April 22.....	0.04
May 28.....	0.13	February 17 ...	0.74	January 24 ....	0.04	November 29 ..	0.66	May 4 .....	0.15
June 27.....	0.01	February 18 ...	1.55	January 25 ....	0.40	November 30 ..	0.63	May 8 .....	0.01
Total ....	9.96	February 19 ...	0.05	January 26 ....	0.01	December 1....	0.02	May 10 .....	0.78
<i>Rain year</i> 1877-78.		February 20 ...	0.09	January 27 ....	0.22	December 2....	0.64	May 11 .....	0.11
1877.		February 23 ...	0.98	January 29 ....	0.02	December 4....	0.08	May 12 .....	0.01
July 15 .....	0.05	February 25 ...	0.19	February 8 ....	0.82	December 5....	0.39	June 23.....	0.01
October 20 .....	0.25	February 26 ...	0.86	February 9 ....	0.75	December 7....	0.35	Total ....	23.62
October 22.....	0.30	February 27 ...	0.42	February 10 ....	0.06	December 9....	0.20	<i>Rain year</i> 1880-81.	
October 24.....	0.01	March 3 .....	0.66	February 11 ...	1.32	December 18...	0.41	1880.	
November 2 ...	0.07	March 4 .....	0.01	February 12 ...	0.29	December 19...	0.77	October 7.....	0.06
November 4 ...	0.27	March 5 .....	0.26	February 13 ...	0.05	December 20...	0.18	October 31.....	0.01
November 5 ...	0.16	March 6 .....	0.76	February 15 ...	0.49	December 21...	0.57	November 22 ..	0.05
November 10 ..	0.56	March 7 .....	0.05	February 16 ...	0.24	December 22...	0.02	November 23 ..	0.84
November 14 ...	0.11	March 9 .....	0.05	February 17 ...	0.15	December 23...	0.22	December 1.....	2.00
November 15 ..	0.15	March 12 .....	0.16	March 1 .....	0.11	1880.		December 2.....	0.74
November 16 ..	0.02	March 13 .....	0.72	March 3 .....	0.01	January 1.....	0.02	December 3.....	0.09
November 22 ..	0.14	March 14 .....	0.01	March 4 .....	3.55	January 2.....	0.05	December 4.....	0.48
December 1.....	0.22	March 17 .....	0.07	March 5 .....	1.55	January 7.....	0.28	December 5.....	0.05
December 15....	0.08	March 20 .....	0.54	March 6 .....	0.71	January 8.....	0.33	December 8.....	0.09
December 16....	1.05	March 21 .....	0.51	March 7 .....	0.30	January 9.....	0.58	December 9.....	0.02
December 17....	0.06	March 26 .....	0.51	March 8 .....	0.88	January 24.....	0.15	December 13....	0.20
December 20....	0.31	March 27 .....	0.01	March 18 .....	0.21	January 25.....	0.46	December 14....	2.00
December 21....	0.02	March 29 .....	0.22	March 19 .....	0.51	January 27.....	0.09	December 16....	0.71
December 22....	0.41	April 2.....	0.04	March 21 .....	0.31	February 8 ....	0.07	December 18....	1.03
December 23....	0.01	April 8.....	0.01	March 22 .....	0.02	February 9 ....	0.27	December 19....	1.08
December 28....	0.25	April 14.....	0.48	March 24 .....	0.01	February 10 ...	0.17	December 20....	0.19
1878.		April 15.....	0.21	March 25 .....	0.02	February 15 ...	0.14	December 21....	0.32
January 5.....	0.02	April 18.....	0.58	March 26 .....	0.06	February 18 ...	0.75	December 22....	0.85
January 6.....	0.15	April 19.....	0.01	April 3.....	0.14	February 19 ...	0.07	December 23....	0.65
January 7.....	0.63	April 20.....	0.01	April 4.....	0.08	February 21 ...	0.23	December 24....	0.08
January 8.....	0.01	May 19.....	0.05	April 6.....	0.60	February 22 ...	0.17	December 25....	0.35
January 9.....	0.32	May 20.....	0.10	April 7.....	0.05	February 23 ...	0.01	December 26....	0.05
January 13.....	0.45	May 29.....	0.02	April 10.....	0.22	February 24 ...	0.08	December 27....	0.14
January 14.....	1.24	May 31.....	0.01	April 12.....	0.01	March 1 .....	0.07	December 28....	0.01
January 15.....	1.09	Total ....	32.81	April 13.....	0.21	March 2 .....	0.45	December 29....	
January 16.....	1.27	<i>Rain year</i> 1878-79.		April 18.....	0.11	March 3 .....	0.11	1881.	
January 17.....	0.01	1878.		April 19.....	0.54	March 16 .....	0.19	January 12.....	0.67
January 18.....	0.30	July 9 .....	0.01	May 6 .....	0.08	March 17 .....	0.08	January 13.....	0.78
January 21.....	0.34	July 16 .....	0.08	May 13 .....	0.03	March 23 .....	0.02	January 14.....	0.81
January 22.....	0.78	September 16 ..	0.02	May 17 .....	0.79	March 24 .....	0.26	January 15.....	0.08
January 23.....	0.27	September 26 ..	0.01	May 18 .....	0.32	March 25 .....	0.08	January 19.....	0.02
January 24.....	1.21	September 28 ..	0.07	May 19 .....	0.25	March 26 .....	0.41	January 25.....	0.42
January 26.....	0.13	September 29 ..	0.86	May 27 .....	0.30	March 27 .....	0.02	January 27.....	3.06
January 27.....	1.41	October 13.....	0.21	June 9 .....	0.04	March 28 .....	0.16	January 28.....	1.98
January 29.....	0.67	October 14.....	0.84	Total ....	22.17	March 31 .....	1.03	January 29.....	0.28
January 30.....	0.41	October 14.....	0.08	<i>Rain year</i> 1879-80.		April 1.....	0.33	January 30.....	0.01
January 31.....	0.37	November 4 ...	0.46	1879.		April 2.....	0.04	February 1 ....	0.39
February 3 ....	0.04	December 5....	0.15	July 7 .....	0.01	April 3.....	0.04	February 2 ....	0.49
February 4 ....	0.65	December 6....	0.02	September 23 ..	0.01	April 5.....	0.21	February 3 ....	0.19
February 5 ....	0.40	December 8....	0.08	October 6.....	0.40	April 8.....	0.57	February 4 ....	0.01
February 6 ....	0.51	December 9....	0.08	October 11.....	0.30	April 9.....	0.18	February 5 ....	0.37
February 7 ....	0.24	December 30...	0.29	November 4 ...	0.08	April 12.....	0.38	February 6 ....	0.04
February 8 ....	0.02	December 31...	0.07	November 5 ...	0.15	April 13.....	0.82	February 7 ....	0.36
February 10 ...	1.02	1879.		November 6 ...	0.08	April 14.....	0.75	February 8 ....	0.10
February 11 ...	0.56	January 8 .....	0.14	November 7 ...	0.10	April 15.....	0.13	February 9 ....	1.13
February 12 ...	0.59	January 11 .....	0.76	November 8 ...	0.23	April 16.....	1.37	February 10 ...	0.10
February 13 ...	1.11	January 13 .....	0.40	November 9 ...	0.05	April 17.....	1.59	February 11 ...	
February 14 ...		January 14 .....	0.04	November 10 ...		April 18.....		February 12 ...	
		January 15 .....		November 11 ...		April 19.....		February 13 ...	
		January 16 .....		November 12 ...		April 20.....		February 14 ...	

## CLIMATOLOGY OF CALIFORNIA.

ALL (INCHES AND HUNDREDTHS) AS MEASURED BY JOHN PETTEE, JANUARY 1, 1865, TO MARCH 19, 1902—Cont'd

te	Amount	Date	Amount	Date	Amount	Date	Amount	Date	Amount
<i>year</i>		<i>Rain year</i>		<i>Rain year</i>		<i>Rain year</i>		<i>Rain year</i>	
1-81		1881-82		1882-83		1883-84		1884-85	
81		1882		1882		1883		1884	
ry 25	0 87	January 23. . .	0 41	November 7	0 13	October 25	0 02	April 10	0 33
ry 26	0 07	January 25. . .	0 39	November 8	0 01	October 26 .	1 05	April 11	1 41
ry 28	0 03	January 26. . .	0 05	November 22	0 22	October 27	0 06	April 12 .	0 04
3	0 68	January 30. . .	0 24	November 25 .	0 02	November 6	0 17	April 13 . . .	0 07
9 .	0 08	January 31. . .	0 02	November 26	0 03	November 7	0 45	April 14	1 33
11	0 01	February 9 . .	0 50	November 29	0 01	November 8	0 26	April 15	0 01
15	0 10	February 10 .	0 22	December 10	0 02	November 24	0 22	April 23	0 12
23 . .	0 03	February 11	0 01	December 11	0 08	December 2 .	0 13	April 26	0 20
26 . .	0 06	February 12	0 31	December 17	0 25	December 3	0 02	May 17	0 13
. . . .	0 01	February 15	0 02	December 19	0 56	December 21	0 27	May 24	0 02
. . . .	0 22	February 16	0 25	December 22	0 10	December 22	0 08	May 25	0 08
. . . .	0 22	February 23	0 59	December 23 .	0 08	December 23 .	0 46	May 31	0 01
. . . .	0 28	February 24	0 01	December 27 .	0 09	December 24 .	0 09	June 7	0 07
0 . . .	0 22	February 25	0 51	December 28	0 01	December 25 .	0 02	June 8	0 63
6 . . .	0 16	February 26	0 14	December 31 .	1 18	December 27 .	0 05	June 9 .	0 01
7 . . .	0 86	February 28	0 02			December 28	0 02	June 11	1 11
1 . . .	0 03	March 1 . . .	0 04	1883				June 12 .	0 89
2 . . .	0 06	March 9	0 81	January 1 . .	0 11	1884		June 13	0 11
. . . .	0 05	March 10	0 40	January 6 . .	0 01	January 2 .	0 05	June 22	0 16
0 . . .	0 15	March 11	0 02	January 16. . .	0 03	January 3 .	0 07		
	0 07	March 12 . .	0 57	January 24 . .	1 08	January 4 .	0 04	Total .	29 12
	0 22	March 13 . .	0 53	February 6 . .	0 11	January 5 .	0 39		
	0 35	March 14 . .	0 54	February 9 . .	0 01	January 8 .	0 02	<i>Rain year</i>	
Total	27 24	March 15 . . .	0 28	February 12 .	0 12	January 24	0 02	1884-85	
<i>n year</i>		March 16 . . .	0 07	February 13 .	0 46	January 25	0 03	1884	
81-82		March 17 . . .	0 21	February 14	0 11	January 26 .	0 58	August 4	0 06
881		March 18 . . .	0 09	March 11 . . .	0 02	January 27 .	0 16	September 7 .	0 21
nber 21..	0 18	April 2 . . .	0 02	March 25 . . .	0 28	January 28 .	0 52	September 30	0 12
nber 22..	0 05	April 3 . . .	0 01	March 26 . . .	1 42	January 29	0 92	October 11 . .	0 04
er 2 . . .	0 12	April 4 . . .	0 01	March 27 . . .	0 44	January 30 .	0 87	October 12	0 98
er 25 . . .	0 03	April 5 . . .	0 32	March 28 . . .	0 45	January 31 .	0 14	October 13 . .	0 38
er 26 . . .	0 26	April 8 . . .	0 43	March 29 . . .	0 18	February 1 .	0 01	October 14	0 80
er 27 . . .	0 11	April 9 . . .	0 50	March 30 . . .	0 07	February 2 .	0 21	October 15	0 06
er 29 . . .	0 11	April 18 . . .	0 01	April 1 . . . .	0 08	February 3 .	0 42	November 7 .	0 01
nber 14 .	0 18	April 19 . . .	0 12	April 2 . . . .	0 51	February 4 .	0 32	November 9 . .	0 04
nber 15..	1 05	April 21.....	0 01	April 3 . . . .	0 03	February 5 .	0 72	November 14 .	0 23
nber 16..	0 28	April 22 . . .	0 07	April 7 . . . .	0 02	February 6 .	0 15	November 15 .	0 01
nber 17..	0 08	April 23 . . .	0 08	April 11 . . .	0 02	February 10 .	0 01	December 16	0 29
nber 27 .	0 08	April 24 . . .	0 01	April 12 . . .	0 08	February 14	1 17	December 17 .	0 59
nber 28..	0 05	May 1 . . . .	0 15	April 18 . . .	0 28	February 15	1 38	December 18 .	0 38
nber 30..	0 35	May 3 . . . .	0 03	April 19 . . .	0 62	February 16	0 71	December 19	0 32
nber 1 . .	0 10	June 5 . . . .	0 03	April 29 . . .	0 07	February 17	0 65	December 20 .	1 48
nber 3 . .	0 23	Total	15 83	May 3 . . . .	0 75	February 19	0 09	December 21	0 04
nber 4 . .	1 11			May 4 . . . .	0 91	March 3 . . .	0 02	December 22 .	0 38
nber 5 . .	0 01	<i>Rain year</i>		May 5 . . . .	0 76	March 4 . . .	0 05	December 23	2 03
nber 6 . .	0 02	1882-83		May 6 . . . .	0 17	March 5 . . .	0 44	December 24	0 40
nber 9 . .	0 01	1882		May 7 . . . .	0 02	March 6 . . .	0 29	December 25	0 65
nber 10 .	0 16	September 30	0 28	May 10 . . . .	0 02	March 7 . . .	1 00	December 26 .	0 01
nber 11 .	0 28	October 1 . .	0 23	May 11 . . . .	0 02	March 8 . . .	1 68	December 27 .	0 07
nber 14 . .	0 06	October 2 . .	0 79	May 12 . . . .	0 15	March 9 . . .	0 41	December 28 .	0 02
nber 15 .	0 51	October 3 . .	0 30	May 14 . . . .	0 56	March 10 . .	0 05	December 31 .	0 09
nber 23 . .	0 26	October 5 . .	0 15	May 15 . . . .	0 07	March 13 . . .	0 30	1885	
nber 25 .	0 07	October 6 . .	0 11	May 16 . . . .	0 03	March 14 . . .	0 69	January 1 . . .	0 24
nber 26 . .	0 45	October 7 . .	0 15	May 29 . . . .	0 02	March 18 . . .	0 06	January 7 . . .	0 06
nber 27 .	0 01	October 10	0 21	Total . . . .	19 59	March 21 . . .	0 05	January 9 . . .	0 92
1882		October 12 . .	0 01			March 22 . . .	0 06	January 10 . .	0 32
ary 1 . . .	0 05	October 13 . .	0 39	<i>Rain year</i>		March 24 . . .	0 90	January 12 . .	0 41
ary 2 . . .	0 09	October 23 .	0 09	1883-84		March 25 . . .	0 15	January 13	0 02
ary 3 . . .	0 16	October 30 . .	0 01	1883		March 26 . . .	0 73	January 27	0 11
ary 4 . . .	0 07	October 31 . .	0 37	September 29..	0 37	March 27 . . .	0 29	January 29 . .	0 03
ary 5 . . .	0 06	November 1 . .	1 30	October 1 . . .	0 03	March 28 . . .	0 01	February 1 . . .	0 06
ary 22 . .	0 22	November 2 . .	2 32	October 23.. .	0 03	April 8 . . . .	1 10	February 2 . . .	0 01
				October 24 . .	0 06	April 9 . . . .	1 10	February 5 . . .	0 01



RAINFALL (INCHES AND HUNDREDTHS) AS MEASURED BY JOHN PETTEE, JANUARY 1, 1865, TO MARCH 19, 1902—Cont'd.

Date.	Amount.	Date.	Amount.	Date.	Amount.	Date.	Amount.	Date.	Amount.
<i>Rain year</i> 1884-85.		<i>Rain year</i> 1885-86.		<i>Rain year</i> 1886-87.		<i>Rain year</i> 1887-88.		<i>Rain year</i> 1888-89.	
1885.		1886.		1886.		1887.		1888.	
February 18 ...	0.10	January 12 ...	0.08	December 28...	0.02	September 21..	0.05	June 9 .....	0.03
February 20 ...	0.05	January 13 ...	0.06	December 28...	0.01	November 5 ...	0.01	June 14 .....	0.17
March 17 .....	0.56	January 15 ...	0.01	December 29...	0.13	November 28 ..	0.50	June 16 .....	0.03
March 18 .....	0.07	January 16 ...	0.07			November 29 ..	0.54	June 18 .....	0.08
March 24 .....	0.04	January 17 ...	0.06	1887.		November 30 ..	0.08	Total ....	16.94
March 25 .....	0.03	January 18 ...	1.05	January 12 ....	0.04	December 1 ...	0.87		
March 30 .....	0.35	January 19 ...	0.27	January 13 ....	0.01	December 2 ...	0.03	<i>Rain year</i>	
April 1 .....	0.03	January 20 ...	0.49	January 14 ....	0.02	December 3 ...	0.05	1888-89.	
April 2 .....	0.02	January 21 ...	0.45	January 15 ....	0.04	December 4 ...	0.05	1888.	
April 3 .....	0.04	January 22 ...	0.65	January 18 ....	0.58	December 7 ...	0.20		
April 4 .....	0.03	January 23 ...	1.37	January 19 ....	0.38	December 11 ..	0.07	July 21 .....	0.01
April 5 .....	0.02	January 24 ...	0.63	January 20 ....	0.28	December 12 ..	0.09	September 14 ..	0.88
April 6 .....	0.99	January 26 ...	0.89	January 24 ....	0.01	December 25 ...	0.09	September 15 ..	0.05
April 7 .....	1.64	February 7 ....	0.02	January 26 ....	0.03	December 27 ...	0.05	October 5 .....	0.03
April 8 .....	0.58	February 26 ...	0.04	January 31 ....	0.14	December 28 ...	1.36	October 6 .....	0.01
April 10 .....	0.03	February 27 ...	0.17	February 1 ....	0.07	December 29 ...	0.19	October 16 .....	0.07
April 16 .....	0.21	March 2 .....	0.24	February 3 ....	0.58	December 30 ...	0.04	October 29 .....	0.02
April 17 .....	0.04	March 3 .....	0.01	February 4 ....	3.53	December 31 ..	0.08	November 14 ..	0.29
April 26 .....	0.01	March 4 .....	0.04	February 5 ....	0.69			November 15 ..	1.85
April 27 .....	0.01	March 6 .....	0.15	February 7 ....	0.20	1888.		November 16 ..	0.10
May 13 .....	0.03	March 8 .....	0.24	February 8 ....	0.10	January 1 .....	1.05	November 17 ..	1.17
June 2 .....	0.01	March 9 .....	0.35	February 9 ....	0.06	January 2 .....	1.52	November 18 ..	0.01
June 8 .....	0.11	March 10 .....	0.01	February 10 ...	0.28	January 3 .....	0.05	November 18 ..	0.01
June 9 .....	0.18	March 16 .....	0.48	February 11 ...	0.86	January 4 .....	0.73	November 20 ..	0.42
June 18 .....	0.01	March 17 .....	0.20	February 12 ...	0.24	January 12 ....	0.01	November 21 ..	0.20
Total ....	17.07	March 30 .....	0.14	February 13 ...	0.71	January 13 ....	0.01	November 22 ...	0.06
<i>Rain year</i>		March 31 .....	0.44	February 14 ...	0.03	January 19 ....	0.26	November 25 ...	0.03
1885-86.		April 1 .....	0.17	February 15 ...	0.04	January 20 ....	1.17	November 29 ...	0.08
1885.		April 5 .....	0.11	February 16 ...	0.30	January 21 ....	0.33	December 1 ...	0.05
July 7 .....	0.03	April 6 .....	0.50	February 20 ...	0.22	January 22 ....	0.04	December 8 ...	0.73
September 23 ..	0.08	April 7 .....	0.09	February 21 ...	0.07	January 23 ....	0.07	December 9 ...	0.36
October 13 .....	0.58	April 9 .....	1.05	February 23 ...	0.02	January 24 ....	0.01	December 10 ...	0.08
October 29 .....	0.01	April 10 .....	1.14	February 24 ...	0.26	January 26 ....	0.15	December 12 ...	1.20
November 1 ...	0.01	April 11 .....	0.02	March 1 .....	0.06	January 28 ....	0.11	December 13 ...	0.56
November 3 ...	0.14	April 12 .....	0.41	March 2 .....	0.32	January 29 ...	0.11	December 14 ...	0.60
November 4 ...	0.55	April 13 .....	0.15	March 3 .....	0.41	January 30 ...	0.37	December 15 ...	0.25
November 5 ...	0.37	April 14 .....	0.16	March 10 .....	0.02	January 31 ...	0.71	December 16 ...	0.03
November 6 ...	1.22	April 15 .....	0.22	March 17 .....	0.08	February 9 .....	0.04	December 20 ...	0.02
November 7 ...	0.02	April 16 .....	0.40	April 4 .....	0.02	February 10 ...	0.34	December 21 ...	0.69
November 8 ...	0.02	May 5 .....	0.03	April 6 .....	0.36	February 11 ...	0.18	December 22 ...	0.19
November 9 ...	0.65	May 6 .....	0.18	April 8 .....	1.10	February 12 ...	0.13	December 23 ...	0.05
November 14 ...	0.13	May 7 .....	0.13	April 9 .....	0.06	February 13 ...	0.07	December 24 ...	0.06
November 15 ...	1.41	Total ....	28.42	April 12 .....	0.05	February 14 ...	0.06	December 25 ...	0.69
November 16 ...	1.36	<i>Rain year</i>		April 13 .....	0.02	February 29 ...	0.03	December 26 ...	0.34
November 17 ...	0.48	1886-87.		April 19 .....	0.37	March 1 .....	1.33	December 28 ...	0.02
November 18 ...	0.48	1886.		April 28 .....	0.07	March 2 .....	0.27	December 29 ...	0.31
November 20 ...	0.25	July 15 .....	0.36	April 29 .....	0.03	March 3 .....	0.05	1889.	
November 21 ...	0.32	October 15 .....	0.71	May 6 .....	0.02	March 4 .....	1.56	January 3 .....	0.85
November 22 ...	0.08	October 16 .....	0.02	May 8 .....	0.01	March 5 .....	0.01	January 10 ....	0.11
November 23 ...	1.46	October 17 .....	0.10	May 9 .....	0.01	March 7 .....	0.04	January 12 ....	0.14
November 24 ...	0.89	October 26 .....	0.13	May 18 .....	0.02	March 12 ....	0.14	January 17 ....	0.23
November 28 ...	0.30	October 27 .....	0.02	May 19 .....	0.01	March 13 ....	0.01	January 20 ....	0.04
December 6 ...	0.03	October 28 .....	0.25	May 23 .....	0.01	March 23 ....	0.02	January 21 ....	0.07
December 10 ...	0.18	October 29 .....	0.36	May 29 .....	0.01	March 30 ....	0.42	February 5 ....	0.02
December 14 ...	0.06	October 30 .....	0.06	June 11 .....	0.01	April 3 .....	0.09	February 14 ...	0.09
December 16 ...	0.01	November 10 ...	0.02	June 12 .....	0.04	May 2 .....	0.11	February 15 ...	0.04
December 20 ...	1.49	November 11 ...	0.02	Total ....	17.04	May 3 .....	0.18	February 17 ...	0.11
December 21 ...	0.87	November 19 ...	0.13	<i>Rain year</i>		May 4 .....	0.03	February 23 ...	0.27
December 22 ...	0.36	November 20 ...	0.48	1887-88.		May 24 .....	0.05	February 24 ...	0.38
December 28 ...	0.08	December 6 ...	0.54	1887.		May 29 .....	0.12	March 7 .....	0.62
December 24 ...	0.60	December 7 ...	0.02	September 4 ...	0.01	May 30 .....	0.06	March 8 .....	0.52
December 25 ...	0.70	December 8 ...	0.89	September 5 ...	0.13	June 1 .....	0.03	March 10 ....	0.44
December 30 ...	0.08	December 22 ...	0.04	September 6 ...	0.07	June 3 .....	0.03	March 11 ....	0.22
						June 6 .....	0.01	March 12 ....	2.55

RAINFALL (INCHES AND HUNDREDTHS) AS MEASURED BY JOHN PETTEE, JANUARY 1, 1865, TO MARCH 19, 1902—Cont'd

Date	Amount	Date	Amount	Date	Amount	Date	Amount	Date	Amount
<i>Rain year</i> 1888-89		<i>Rain year</i> 1889-90		<i>Rain year</i> 1889-90		<i>Rain year</i> 1890-91		<i>Rain year</i> 1891-92.	
1889		1889		1890		1891		1892	
March 13	0 53	December 5	1 22	March 6	0 53	February 27	0 51	January 1	0 01
March 14	0 02	December 6	0 97	March 7	0 15	February 28	0 68	January 6	0 32
March 15	0 90	December 7	1 05	March 8	0 36	March 1	0 08	January 7	0 16
March 16	0 08	December 8	0 39	March 9	0 13	March 2	0 01	January 8	0 04
March 17	0 45	December 9	0 16	March 17	0 40	March 3	0 14	January 25	1 18
March 19	0 67	December 10	0 37	March 18	1 49	March 5	0 17	January 26	0 07
March 26	0 02	December 11	0 77	March 22	0 10	March 9	0 05	January 29	0 01
March 27	0 02	December 12	0 02	March 24	0 02	March 10	0 04	January 31	0 27
April 1	0 04	December 16	0 48	March 25	0 26	March 11	0 02	February 3	0 40
April 2	0 02	December 17	0 72	March 28	0 23	March 12	0 01	February 5	0 30
April 3	0 13	December 18	0 67	March 29	0 21	March 15	0 27	February 6	0 07
April 4	0 04	December 19	0 83	March 30	0 15	March 26	0 39	February 16	0 04
April 7	0 81	December 20	0 09	April 5	0 58	March 27	0 10	February 17	0 89
April 8	0 01	December 21	2 03	April 17	0 52	April 4	0 01	February 18	0 68
April 9	0 03	December 22	0 30	April 18	0 04	April 6	1 24	February 19	0 22
April 12	0 18	December 23	0 89	April 29	0 06	April 7	0 13	February 20	0 01
April 13	0 06	December 24	0 89	May 6	0 13	April 9	0 29	February 23	0 03
April 14	0 19	December 25	0 01	May 7	0 43	April 10	0 12	February 29	0 38
May 1	0 07	December 26	0 04	May 9	0 52	April 12	0 23	March 1	0 14
May 3	0 15	December 27	0 07	May 10	0 22	April 13	0 20	March 2	0 13
May 4	1 18	December 28	0 02	June 16	0 01	April 15	0 03	March 14	0 88
May 5	0 23	December 29	0 06	June 22	0 02	April 16	0 46	March 15	0 11
May 6	0 38	December 30	0 06	Total	46 42	May 5	0 74	March 17	0 08
May 7	0 12	December 31	0 12			May 6	0 01	March 18	0 66
May 11	0 01	1890		<i>Rain year</i> 1890-91		May 26	0 18	March 19	0 14
May 12	0 02	January 1	0 13	1890		May 27	0 39	March 22	0 08
May 13	0 05	January 2	1 06	July 7	0 01	May 29	0 02	March 26	0 37
May 14	0 13	January 3	0 39	September 27	0 01	May 30	0 04	March 27	0 02
June 27	0 01	January 4	0 38	September 28	0 01	June 10	0 08	March 29	0 90
Total	24 26	January 6	0 06	September 29	0 16	June 11	0 01	March 30	0 04
<i>Rain year</i> 1889-90		January 9	0 04	September 29	0 16	Total	18 64	March 31	0 17
1889		January 11	0 14	November 24	0 03	<i>Rain year</i> 1891-92		April 1	0 17
October 6	0 55	January 12	0 61	November 25	0 02	July 8	0 10	April 2	0 02
October 7	0 33	January 14	0 02	December 2	1 75	July 9	0 01	April 14	0 26
October 8	0 01	January 15	1 02	December 3	0 29	September 4	0 04	April 16	0 08
October 17	2 20	January 16	0 57	December 4	0 02	September 5	0 02	April 20	0 24
October 19	0 96	January 17	0 59	December 18	0 44	September 8	0 01	April 21	0 04
October 20	0 48	January 18	0 03	December 29	0 84	September 12	0 09	April 23	0 09
October 21	1 00	January 19	0 48	December 30	0 06	September 14	0 04	April 24	0 01
October 22	0 07	January 20	0 61	December 31	0 05	September 21	0 63	April 28	0 28
October 24	0 47	January 21	0 10	1891		October 28	0 07	April 29	0 04
October 25	0 44	January 22	0 36	January 1	0 17	November 4	0 06	April 30	0 21
October 26	0 69	January 23	0 32	January 4	0 82	November 18	0 25	May 1	0 07
October 27	0 01	January 24	2 06	January 16	0 02	November 29	0 01	May 4	0 01
October 29	0 01	January 25	0 05	January 31	0 02	November 30	0 32	May 5	0 38
October 29	0 01	January 28	0 06	February 1	0 08	December 1	0 03	May 6	0 06
November 16	0 03	January 29	0 31	February 4	0 06	December 3	1 15	May 9	0 08
November 17	1 08	February 3	0 03	February 6	0 08	December 8	0 40	May 14	1 07
November 18	0 29	February 4	0 02	February 10	0 04	December 9	0 01	Total	20 24
November 19	0 86	February 5	0 04	February 11	0 02	December 16	0 48	<i>Rain year</i> 1892-93	
November 20	0 06	February 15	0 88	February 13	0 01	December 19	0 55	1892	
November 21	0 03	February 16	0 25	February 14	1 81	December 22	0 10	September 28	0 02
November 22	0 25	February 17	0 51	February 15	2 39	December 26	0 57	October 5	0 02
November 28	0 01	February 18	0 78	February 17	0 48	December 27	0 02	October 8	0 29
November 29	0 31	February 19	1 96	February 19	0 04	December 29	1 68	October 15	0 85
November 30	0 05	February 20	0 35	February 21	0 78	December 31	1 12	October 16	0 36
December 1	0 08	February 21	0 66	February 22	0 52	December 31	1 00	October 29	0 81
December 2	0 26	February 24	0 14	February 23	0 24			October 30	0 15
December 3	0 26	February 25	0 02	February 24	0 08			November 22	0 26
December 4	1 40	March 3	0 13	February 26	0 34				
		March 4	0 28						

RAINFALL (INCHES AND HUNDREDTHS) AS MEASURED BY JOHN PETTEE, JANUARY 1, 1865, TO MARCH 19, 1902—Cont'd.

Date.	Amount.	Date.	Amount.	Date.	Amount.	Date.	Amount.	Date.	Amount.
<i>Rain year</i> 1892-93.		<i>Rain year</i> 1893-94.		<i>Rain year</i> 1893-94.		<i>Rain year</i> 1894-95.		<i>Rain year</i> 1895-96.	
1892.		1893.		1894.		1895.		1895.	
November 23 ..	0.28	September 8 ...	0.13	March 15 .....	0.06	January 6 .....	0.02	December 14...	0.18
November 25 ..	0.43	September 10 ..	0.16	March 16 .....	0.02	January 7 .....	0.27	December 15...	0.05
November 26 ..	0.16	September 11 ..	0.05	March 18 .....	0.03	January 8 .....	0.84	December 16...	0.08
November 27 ..	1.55	October 8 .....	0.17	March 29 .....	0.02	January 12 .....	0.56	December 17...	0.12
November 28 ..	0.03	October 14 .....	0.02	April 21 .....	0.01	January 15 .....	1.02	December 18...	0.26
November 29 ..	1.28	October 15 .....	0.01	April 24 .....	0.18	January 16 .....	0.88	December 19...	0.57
November 30 ..	1.32	October 30 .....	0.03	April 25 .....	0.03	January 17 .....	0.81	December 20...	0.32
December 1 ....	0.46	November 5 .....	0.06	April 26 .....	0.34	January 18 .....	0.58	December 21...	0.07
December 2 ....	2.82	November 6 .....	0.11	May 13 .....	0.30	January 20 .....	0.14	December 23...	0.02
December 3 ....	0.24	November 8 .....	0.02	May 14 .....	0.18	January 21 .....	0.70		
December 4 ....	0.01	November 22 ..	0.04	May 20 .....	0.15	January 22 .....	0.76	1896.	
December 21 ....	0.03	November 23 ..	1.33	May 25 .....	0.95	February 10 ...	0.63	January 12 ....	0.03
December 22 ....	0.07	November 24 ..	0.18	May 26 .....	0.30	February 11 ...	2.35	January 13 ....	0.75
December 23 ....	1.43	November 25 ..	1.58	May 30 .....	0.09	February 12 ...	0.17	January 14 ....	0.18
December 24 ....	0.56	November 26 ..	1.20	May 31 .....	0.02	February 21 ...	0.15	January 15 ....	0.96
December 25 ....	0.34	November 27 ..	0.15	June 1 .....	0.15	February 22 ...	0.27	January 16 ....	0.93
December 26 ....	0.01	November 29 ..	0.53	June 2 .....	0.07	March 12 .....	0.02	January 17 ....	2.30
		November 30 ..	0.01	June 3 .....	0.17	March 16 .....	0.02	January 18 ....	0.04
1893.		December 13 ...	0.04	June 16 .....	0.17	March 17 .....	0.13	January 19 ....	1.41
January 14 ....	0.24	December 14 ...	0.27	Total ...	24.44	March 19 .....	0.72	January 20 ....	0.27
January 15 ....	0.19	December 20 ...	1.16	<i>Rain year</i>		March 21 .....	0.53	January 21 ....	0.02
January 25 ....	0.45	December 21 ...	0.31	1894-95.		March 26 .....	0.37	January 22 ....	0.64
January 26 ....	0.64	December 22 ...	0.01	1894.		March 27 .....	0.73	January 23 ....	0.77
January 27 ....	0.82	December 23 ...	0.51	September 29 ..	1.56	April 1 .....	0.01	January 25 ....	0.15
January 29 ....	1.36	December 24 ...	0.23	October 17 .....	0.81	April 9 .....	0.02	January 26 ....	1.82
January 30 ....	0.11	December 25 ...	0.02	October 18 .....	0.05	April 13 .....	0.04	January 27 ....	0.95
February 1 ....	0.30	December 26 ...	0.39	October 19 .....	0.40	April 26 .....	0.73	January 31 ....	0.19
February 2 ....	0.04	December 31 ...	0.42	October 20 .....	0.41	April 27 .....	0.57	February 20 ...	0.02
February 3 ....	0.25			October 22 .....	0.77	May 1 .....	0.36	February 26 ...	0.05
February 4 ....	0.66	1894.		October 23 .....	0.03	May 3 .....	0.08	February 27 ...	0.12
February 5 ....	0.04	January 1 .....	0.45	November 26 ..	0.88	May 4 .....	0.04	February 28 ...	0.05
February 7 ....	0.37	January 2 .....	0.02	November 27 ..	0.16	May 5 .....	0.03	March 1 .....	0.80
February 8 ....	1.03	January 7 .....	0.02	December 1 ....	0.01	May 25 .....	0.09	March 2 .....	0.80
February 9 ....	0.23	January 14 .....	1.80	December 2 ....	0.19	May 26 .....	0.16	March 3 .....	0.08
February 11 ...	0.12	January 15 .....	0.78	December 3 ....	0.02	May 27 .....	0.09	March 4 .....	0.01
March 3 .....	0.62	January 16 .....	0.04	December 4 ....	0.70	May 28 .....	0.09	March 5 .....	0.29
March 4 .....	0.48	January 17 .....	0.44	December 5 ....	1.04	Total ....	34.93	March 14 .....	0.84
March 7 .....	0.78	January 18 .....	0.12	December 6 ....	0.37			March 15 .....	0.97
March 10 .....	1.29	January 19 .....	3.17	December 7 ....	0.76	<i>Rain year</i>		March 16 .....	0.02
March 11 .....	0.14	January 20 .....	1.01	December 8 ....	1.19	1895-96.		March 19 .....	0.04
March 14 .....	0.13	January 21 .....	0.22	December 9 ....	0.40	1895.		March 20 .....	0.04
March 15 .....	0.07	January 22 .....	0.02	December 10 ...	0.31	July 4 .....	0.01	March 21 .....	0.13
March 17 .....	0.05	January 23 .....	0.04	December 11 ...	0.04	September 9 ...	0.11	March 22 .....	0.05
March 18 .....	0.48	January 29 .....	0.02	December 14 ...	0.10	September 10 ..	0.02	March 23 .....	0.01
March 19 .....	0.72	February 4 .....	0.67	December 15 ...	0.01	September 11 ..	0.04	March 25 .....	0.13
March 20 .....	0.31	February 5 .....	0.02	December 16 ...	0.03	September 12 ..	0.85	March 26 .....	0.26
March 23 .....	0.17	February 6 .....	0.05	December 17 ...	0.32	October 14 .....	0.07	March 27 .....	0.01
March 29 .....	0.06	February 7 .....	0.11	December 18 ...	1.58	October 15 .....	0.02	April 4 .....	0.62
April 2 .....	0.01	February 8 .....	0.03	December 19 ...	0.88	October 20 .....	0.03	April 5 .....	1.40
April 5 .....	0.95	February 9 .....	0.20	December 20 ...	1.29	October 25 .....	0.08	April 6 .....	0.01
April 6 .....	0.06	February 11 ...	0.02	December 21 ...	0.32	November 2 ...	0.13	April 8 .....	0.40
April 7 .....	0.03	February 14 ...	0.01	December 22 ...	0.06	November 3 ...	0.12	April 9 .....	0.08
April 9 .....	0.16	February 15 ...	0.74	December 23 ...	0.29	November 5 ...	1.28	April 13 .....	0.29
April 11 .....	0.06	February 17 ...	0.25	December 26 ...	0.29	November 12 ...	0.01	April 14 .....	0.01
April 21 .....	0.20	February 18 ...	0.14	December 27 ...	0.19	November 26 ...	0.28	April 15 .....	0.06
April 22 .....	0.03	February 19 ...	1.86	December 28 ...	0.20	November 27 ...	0.04	April 18 .....	0.04
May 7 .....	0.01	February 20 ...	0.02	December 29 ...	0.20	November 28 ...	0.19	April 21 .....	0.26
May 14 .....	0.01	February 27 ...	0.01	December 30 ...	0.45	November 29 ...	0.02	April 22 .....	0.14
May 15 .....	0.04	March 1 .....	0.39			November 30 ...	0.01	April 23 .....	3.18
May 16 .....	0.18	March 2 .....	0.07	1895.		December 1 .....	0.02	April 24 .....	0.33
June 21 .....	0.03	March 5 .....	0.26	January 3 .....	2.07	December 4 .....	0.08	April 25 .....	0.24
Total ....	27.15	March 7 .....	0.03	January 4 .....	1.54	December 5 .....	0.26	April 26 .....	0.04
		March 8 .....	0.03	January 5 .....	0.20	December 6 .....	0.02	April 29 .....	0.03

RAINFALL (INCHES AND HUNDREDTHS) AS MEASURED BY JOHN PETTER, JANUARY 1, 1865, TO MARCH 19, 1902—Cont'd.

Date	Amount	Date	Amount	Date	Amount	Date	Amount	Date	Amount
<i>Rain year</i> 1895-96		<i>Rain year</i> 1896-97		<i>Rain year</i> 1897-98		<i>Rain year</i> 1898-99		<i>Rain year</i> 1899-1900	
1896		1897		1898		1899		1899	
April 30 . . .	0 02	February 4 . .	1 36	January 5 . .	0 19	January 1 . . .	1 08	November 25 . .	0 01
May 1 . . . . .	0 02	February 5 . .	0 22	January 6 . .	0 25	January 2 . . .	0 12	November 27 . .	0 03
May 3 . . . . .	0 15	February 6 . .	0 08	January 8 . .	0 07	January 6 . . .	0 94	November 28 . .	0 23
May 4 . . . . .	0 08	February 7 . .	0 43	January 11 . .	0 40	January 7 . . . .	0 06	November 29 . .	0 01
May 6 . . . . .	0 01	February 11 . .	0 07	January 15 . .	0 27	January 9 . . . .	1 25	December 4 . . .	0 09
May 10 . . . . .	0 52	February 12 . .	0 23	January 16 . .	0 14	January 10 . . .	0 67	December 7 . . .	0 28
May 20 . . . . .	0 20	February 14 . .	0 04	January 18 . .	0 08	January 11 . . .	0 25	December 10 . .	0 13
May 21 . . . . .	0 31	February 15 . .	0 04	January 24 . .	0 08	January 13 . . .	0 78	December 11 . .	0 19
May 23 . . . . .	0 04	February 16 . .	0 08	January 31 . .	0 36	January 14 . . .	0 39	December 13 . .	0 22
Total . . . . .	29 36	February 17 . .	0 11	February 2 . .	0 07	January 15 . . .	0 06	December 14 . .	1 83
<i>Rain year</i> 1896-97		February 18 . .	0 47	February 5 . .	0 29	January 16 . . .	0 01	December 15 . .	0 53
1896		February 19 . .	0 26	February 6 . .	0 24	January 31 . . .	0 03	December 16 . .	0 28
July 10 . . . . .	0 01	February 23 . .	0 45	February 11 . .	0 01	February 1 . . .	0 14	December 29 . .	1 01
August 17 . . .	0 01	March 1 . . . .	0 63	February 20 . .	0 73	February 2 . . .	0 02	December 31 . .	0 04
August 18 . . .	0 02	March 2 . . . .	0 99	February 23 . .	0 67	February 28 . .	0 49	1900	
August 29 . . .	0 06	March 4 . . . .	0 17	February 24 . .	0 61	March 1 . . . .	0 25	January 1 . . . .	1 51
September 18 . .	0 06	March 5 . . . .	0 74	February 25 . .	0 02	March 2 . . . .	0 03	January 2 . . . .	2 37
September 19 . .	0 03	March 6 . . . .	1 08	February 26 . .	0 01	March 8 . . . .	0 07	January 3 . . . .	0 01
September 20 . .	0 02	March 7 . . . .	0 13	February 27 . .	0 81	March 10 . . . .	0 01	January 4 . . . .	0 26
September 21 . .	0 49	March 8 . . . .	0 04	March 7 . . . .	0 18	March 11 . . . .	0 01	January 5 . . . .	0 01
October 10 . . .	0 03	March 16 . . .	0 06	March 14 . . . .	0 08	March 13 . . . .	0 06	January 6 . . . .	0 67
October 25 . . .	0 02	March 17 . . .	0 07	March 16 . . . .	0 42	March 14 . . . .	1 32	January 7 . . . .	0 11
October 26 . . .	1 74	March 18 . . .	0 04	March 24 . . . .	0 08	March 15 . . . .	1 43	January 28 . . .	0 28
October 29 . . .	0 05	March 19 . . .	0 05	April 5 . . . . .	0 22	March 16 . . . .	0 15	February 1 . . . .	0 09
October 31 . . .	0 05	March 25 . . .	0 02	May 12 . . . . .	0 05	March 18 . . . .	0 05	February 3 . . . .	0 05
November 8 . . .	0 63	March 27 . . .	2 13	May 13 . . . . .	0 01	March 19 . . . .	0 79	February 17 . . .	0 06
November 9 . . .	0 28	March 28 . . .	0 02	May 14 . . . . .	1 54	March 20 . . . .	0 14	February 18 . . .	0 07
November 16 . .	0 30	March 31 . . .	0 43	May 15 . . . . .	0 15	March 21 . . . .	1 01	February 19 . . .	0 02
November 17 . .	0 02	April 5 . . . .	0 07	May 21 . . . . .	0 15	March 22 . . . .	2 29	February 20 . . .	0 23
November 19 . .	0 56	April 18 . . .	0 04	May 26 . . . . .	0 02	March 23 . . . .	2 03	February 25 . . .	0 02
November 20 . .	0 01	May 13 . . . .	0 02	May 27 . . . . .	0 10	March 24 . . . .	0 41	March 2 . . . . .	0 25
November 21 . .	0 56	May 16 . . . .	0 70	May 31 . . . . .	0 35	March 28 . . . .	0 04	March 3 . . . . .	1 46
November 22 . .	0 32	June 14 . . . .	0 01	June 8 . . . . .	0 06	April 17 . . . . .	0 02	March 4 . . . . .	0 06
November 23 . .	3 20	June 19 . . . .	0 28	June 9 . . . . .	0 01	April 22 . . . . .	0 01	March 5 . . . . .	0 05
November 24 . .	0 06	June 20 . . . .	0 02	Total . . . . .	13 67	April 23 . . . . .	0 89	March 6 . . . . .	0 44
December 11 . .	0 28	Total . . . . .	81 01	<i>Rain year</i> 1898-99.		April 24 . . . . .	0 13	March 7 . . . . .	0 83
December 12 . .	0 18	<i>Rain year</i> 1897-98.		1898		April 25 . . . . .	0 03	March 8 . . . . .	0 18
December 13 . .	0 08	1897		August 1 . . . .	0 11	April 26 . . . . .	0 06	March 17 . . . .	0 01
December 14 . .	1 49	September 2 . .	0 02	August 2 . . . .	0 05	April 27 . . . . .	0 03	March 18 . . . .	0 02
December 15 . .	0 72	September 30 . .	0 08	September 21 . .	0 15	April 30 . . . . .	0 24	April 1 . . . . .	0 50
December 16 . .	0 02	October 6 . . . .	0 01	September 24 . .	0 72	May 23 . . . . .	0 15	April 2 . . . . .	0 21
December 23 . .	0 03	October 12 . . .	0 02	September 25 . .	0 32	May 24 . . . . .	0 08	April 6 . . . . .	0 03
December 25 . .	0 24	October 21 . . .	0 29	October 1 . . . .	0 25	May 30 . . . . .	0 08	April 10 . . . . .	0 07
December 26 . .	1 22	October 22 . . .	1 67	October 5 . . . .	0 02	May 31 . . . . .	0 96	April 11 . . . . .	0 50
December 27 . .	0 15	October 23 . . .	0 44	October 6 . . . .	0 03	June 24 . . . . .	0 01	April 19 . . . . .	0 36
December 28 . .	0 11	November 4 . . .	0 25	October 7 . . . .	0 38	Total . . . . .	24 12	April 20 . . . . .	0 01
December 29 . .	0 57	November 6 . . .	0 03	October 20 . . .	0 15	<i>Rain year</i> 1899-1900		April 30 . . . . .	0 01
December 30 . .	0 44	November 13 . .	0 02	October 30 . . .	0 05	1899		May 3 . . . . .	0 05
1897		November 19 . .	0 15	November 18 . .	0 45	October 1 to 31 .	4 57	May 4 . . . . .	0 05
January 16 . . .	0 04	November 20 . .	0 03	November 19 . .	0 17	November 3 . . .	0 14	May 9 . . . . .	0 22
January 23 . . .	0 08	November 22 . .	0 61	November 21 . .	0 07	November 8 . . .	0 30	May 10 . . . . .	0 01
January 27 . . .	0 24	November 23 . .	0 13	November 22 . .	0 13	November 8 . . .	0 30	June 10 . . . . .	0 04
January 28 . . .	1 20	November 24 . .	0 07	November 23 . .	0 15	November 9 . . .	0 50	June 14 . . . . .	0 02
January 29 . . .	0 05	December 6 . . .	0 03	November 29 . .	0 15	November 10 . .	0 39	Total . . . . .	25 37
January 30 . . .	0 65	December 7 . . .	1 40	December 13 . .	0 57	November 11 . .	0 40	<i>Rain year</i> 1900-1901	
January 31 . . .	1 85	December 8 . . .	0 02	December 14 . .	0 15	November 15 . .	0 33	1900	
February 1 . . .	0 11	December 10 . .	0 10	December 18 . .	0 78	November 16 . .	0 84	August 13 . . . .	0 02
February 2 . . .	0 08	December 11 . .	0 07	December 19 . .	0 06	November 18 . .	0 19	August 15 . . . .	0 01
February 3 . . .	1 07	December 13 . .	0 21	December 20 . .	0 81	November 20 . .	0 85	September 4 . . .	0 02
				December 29 . .	0 03	November 21 . .	0 71		

RAINFALL (INCHES AND HUNDREDTHS) AS MEASURED BY JOHN PETTEE, JANUARY 1, 1865, TO MARCH 19, 1902—Cont'd.

Date.	Amount.	Date.	Amount.	Date.	Amount.	Date.	Amount.	Date.	Amount.
<i>Rain year</i> 1900-1901.		<i>Rain year</i> 1900-1901.		<i>Rain year</i> 1900-1901.		<i>Rain year</i> 1901-2.		<i>Rain year</i> 1901-2.	
1900.		1901.		1901.		1901.		1902.	
September 11..	0.63	January 1.....	0.06	March 24 .....	0.03	November 9 ...	1.20	February 5.....	0.04
September 14..	0.01	January 2.....	0.01	March 25 .....	0.07	November 10 ..	0.08	February 6.....	0.48
October 1.....	0.01	January 3.....	0.36	April 1.....	0.11	November 14..	0.22	February 7.....	1.06
October 2.....	0.51	January 4.....	1.26	April 2.....	0.18	November 15..	0.09	February 8.....	0.28
October 4.....	0.44	January 5.....	0.09	April 5.....	0.10	November 18..	0.16	February 10....	0.02
October 11.....	0.04	January 6.....	1.80	April 28.....	1.40	November 19..	0.01	February 11....	0.48
October 18.....	0.14	January 7.....	0.04	April 29.....	0.75	November 20..	1.88	February 13....	0.32
October 19.....	0.51	January 8.....	0.02	April 30.....	0.34	November 23..	0.14	February 14....	1.58
October 27.....	0.21	January 10....	0.44	May 17.....	0.03	November 24..	0.01	February 15....	0.08
October 30.....	0.29	January 11....	0.50	May 20.....	0.73	November 26..	0.01	February 16....	0.20
October 31.....	0.03	January 19....	0.10	May 22.....	0.01	November 27..	0.10	February 19....	0.18
November 7 ...	0.16	January 20....	0.45	May 25.....	0.18	November 28..	0.62	February 20....	0.46
November 15 ..	0.98	January 21....	1.12	May 26.....	0.02	December 1....	0.33	February 21....	1.73
November 16 ..	1.03	January 25....	0.01	Total .....	27.14	December 2....	0.12	February 22....	0.11
November 17 ..	0.15	February 2.....	0.01	<i>Rain year</i> 1901-2.		December 3....	0.53	February 23....	1.14
November 18 ..	0.01	February 3.....	0.61	1901.		December 5....	0.56	February 24....	0.95
November 19 ..	0.32	February 4.....	0.97	September 22..	0.69	December 9....	0.02	February 25....	0.54
November 20 ..	2.03	February 7.....	0.23	September 23..	0.07	December 10...		February 26....	0.45
November 21 ..	0.11	February 8.....	0.06	September 25..	0.03	January 1.....	0.18	February 27....	0.01
November 24 ..	0.02	February 13....	0.22	September 29..	0.06	January 15....	0.02	March 1 .....	1.29
November 25 ..	0.11	February 16....	0.10	September 30..	0.02	January 18....	0.30	March 2 .....	0.05
December 12...	0.03	February 18....	1.22	October 1.....	0.01	January 20....	0.10	March 5 .....	1.07
December 13...	0.25	February 19....	0.48	October 2.....	0.04	January 21....	0.64	March 6 .....	0.04
December 14...	0.41	February 20....	0.08	October 23.....	0.01	January 23....	0.51	March 7 .....	0.47
December 15...	0.17	February 22....	1.64	October 25.....	0.06	January 24....	0.03	March 8 .....	0.54
December 16...	0.86	February 23....	0.36	October 26.....	0.79	January 30....	0.07	March 13 .....	0.01
December 19...	0.03	March 9 .....	0.53	October 27.....	0.12	February 1....	0.22	March 18 .....	0.22
December 20...	0.33	March 10 .....	0.50			February 3....	0.02	Total to	
						February 4....	0.18	Mar. 19.	24.05

## RECAPITULATION.

1865-66.....	23.57	1873-74.....	24.55	1881-82.....	15.83	1889-90.....	46.42	1897-98.....	13.67
1866-67.....	35.94	1874-75.....	18.15	1882-83.....	19.59	1890-91.....	18.64	1898-99.....	24.12
1867-68.....	40.62	1875-76.....	28.28	1883-84.....	29.12	1891-92.....	20.24	1899-1900.....	25.37
1868-69.....	20.56	1876-77.....	9.96	1884-85.....	17.07	1892-93.....	27.15	1900-1901.....	27.14
1869-70.....	20.22	1877-78.....	32.81	1885-86.....	28.42	1893-94.....	24.44	1901-2 to Mar.	
1870-71.....	13.10	1878-79.....	22.17	1886-87.....	17.04	1894-95.....	34.93	19.....	24.05
1871-72.....	23.91	1879-80.....	23.02	1887-88.....	16.94	1895-96.....	29.36		
1872-73.....	19.54	1880-81.....	27.24	1888-89.....	24.26	1896-97.....	31.01		



# CLIMATE OF SOUTHERN COAST.

## SAN LUIS OBISPO.

Data by Mr. JOHN R. WILLIAMS, Observer, U. S. Weather Bureau

San Luis Obispo is situated in latitude 35° 18' north, longitude 120° 39' west. It is distant from Port Harford, or the Pacific Ocean, about 10 miles. A range of low hills intervenes between the coast and the city. The average elevation of the San Luis Range to the west is about 1,000 feet. The San Luis Valley southwest of the city has a general elevation of less than 150 feet. Directly west of the city, at a distance of about 1 mile, is a large hill (Cerro San Luis Obispo), elevation 1,292 feet. East of the city are the foothills of the Santa Lucia Range, varying in elevation from 1,700 feet 2 miles east of the city to 2,830 feet 5 miles east. The general elevation of the city is about 200 feet above sea level. The elevation of the Weather Bureau office is 201 feet.

Owing to the topography, the range of temperature is large. Daily ranges of 40° or more are not infrequent. The lowest temperature<sup>a</sup> recorded is 24° and the highest 106°. The mean annual temperature is 58.9°. The mean annual rainfall, based upon Weather Bureau records covering a period of six years, is 17.22 inches.

The following table, showing the seasonal rainfall at San Luis Obispo for the past twenty-eight years, is taken from the pamphlet "On the climate and wealth of San Luis Obispo County," by Myron Angel:

MONTHLY AND ANNUAL PRECIPITATION (INCHES AND HUNDREDTHS).

Season of—	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar.	April	May.	June	July	Total.
1869-70. ....			0 84	0 68	0 78	0 71	4 85	0 74	2 40	0 85			11.88
1870-71. ....			0 68	0 38	2 90	1 51	4 43		2 79	0 28			12.97
1871-72. ....				2 40	13 93	5 16	3 45	0 71	1 37				27 02
1872-73. ....					6 00	5 00	1 79						12 79
1873-74. ....					7 96	4 29	4 04	3 23	1 00				20.52
1874-75. ....			4 28	2 05	0 48	12.10	0 28	0 50					19 69
1875-76. ....				6 20	2 20	9 87	5.29	5.30	1 26				30 12
1876-77. ....			1 16			4 83	0 42	1 74					8 15
1877-78. ....				1 42	3 90	7 88	11 91	2 74	2 75				30.60
1878-79. ....				1 50	2 58	1 78	2 15	1 60	1.80	0 25			11.66
1879-80. ....			0 75	1 40	3.03	1 75	7.23	2 36	8 78	0 52			25 82
1880-81. ....				0 48	13 35	4.71	1 90	1 40	1.85				23 69
1881-82. ....		0 40	1 65	0 25	2 00	0 85	3 40	6 75	1 73				17.08
1882-83. ....			0 69	2 95	0 44	1 50	1 60	4 88	1.10	3 85			17 01
1883-84. ....					3.56	10 57	10 21	12 41	3.39		2 26		42 40
1884-85. ....			2 17	0 13	8 85	2 25		0 94	3.15	0 10			17.59
1885-86. ....			0 04	12 90	3 67	5 78	0 79	2 37	3.75				29 30
1886-87. ....			0 25	1 25	1.06	1 10	9 60	1 29	1 56	0 36	0 07	0 02	16 56
1887-88. ....			2 05	0 25	1 40	3 15	0 28	3 84	0 14	0 16	0 04		18.33
1888-89. ....				4 48	3 36	1 50	2 08	7 51	0 61				19 54
1889-90. ....			9.19	2 46	11.37	7 27	4 67	3.07	0 29	0 41			38.33
1890-91. ....		0 82		0 42	6 04	0 85	7 14	1 97	1 96	0 13	0 15		19 51
1891-92. ....		0 27		0 20	5 15	0 70	2 88	4.25	0 60	2.23	0 05		16.33
1892-93. ....			0 15	2 76	6 57	4 02	6 35	9.33	1.14	0 08			30 40
1893-94. ....		0 03	0 82	0 45	1 64	1 33	2.31	0 79	0 41	1 32	0 21	0 05	9 86
1894-95. ....		1 31	1 71	0 35	5 45	3 02	1.92	2 98	0 67	0 47			23.33
1895-96. ....	T	T.	1 80	1 56	0 68	3 28		3.16	2 22	0 10	T.	0 04	17.79
1896-97. ....	0 20	T	1 44	3 02	3 04	5.22	4 40	3 17	0 18				20 67

<sup>a</sup> On January 2, 1901, a minimum temperature of 22° F. occurred.

Rainfall in twenty-eight years, 539.24 inches; average in twenty-eight years, 21.04 inches.

## CLIMATOLOGY OF CALIFORNIA.

## PRECIPITATION, IN INCHES AND HUNDREDTHS—Continued.

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1895.....	8 05	1 82	2 44	0 67	0 47	0 00	0 00	T	T	1 80	1 56	0 68	17 49
1896.....	8 23	0 00	3 16	2 22	0 10	T	0 04	0 20	T	1 44	3 02	3 04	21 45
1897.....	5 22	4 40	3 17	0 18	0 04	T	0 00	0 00	0 07	0 79	0 07	0 65	14 59
1898.....	1 37	2 20	0 91	0 06	1 04	0 04	0 00	0 00	0 20	0 39	0 08	0 64	6 93
1899.....	5 56	0 28	7 62	1 54	0 10	0 92	0 00	0 00	0 00	3 92	1 94	4 51	26 39
1900.....	2 13	0 16	2 18	0 98	1 38	0 01	T	T	T	1 93	8 01	0 26	17 04
Average (six years) . . .	5 09	1 43	3 25	0 94	0 52	0 16	T	0 03	0 04	1 71	2 45	1 63	17 32

## WIND VELOCITY (MILES PER HOUR) AND DIRECTION

	Velocity	Direction	Date	Average hourly	Average direction		Velocity	Direction	Date	Average hourly	Average direction
January .....	33	NW	16, 1895	5 1	N	August . . . . .	21	W	14, 1899	4 4	W
February .....	28	S	24, 1898	5 3	N	September . . . . .	22	N	8, 1899	4 6	W
March .....	28	SE	3, 1896	5 6	W	October . . . . .	24	N	13, 1898	4 5	N
April .....	30	S	24, 1896	6 1	W	November . . . . .	28	N	30, 1899	4 7	N
May .....	28	W	1, 1897	6 3	W	December . . . . .	27	N	1, 1900	5 0	N
June.....	26	W	4, 1896	5 0	W	Annual . . . . .	33	NW	α 1895	5 1	W
July .....	21	N	8, 1899	4 4	W						

α January

## SNOWFALL.

The only snowfall at the station, one-half inch, occurred March 3, 1896~

## MEAN MONTHLY AND ANNUAL TEMPERATURE (FAHRENHEIT)

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1895 . . . . .	49 7	54 5	52 4	55 6	58 8	63 6	65 6	65 6	64 6	62 7	56 6	52 7	58 5
1896 . . . . .	54 1	56 2	56 2	51 4	58 2	63 8	67 6	66 5	64 3	62 2	56 8	54 5	59 3
1897. . . . .	51 8	51 6	50 6	59 6	61 2	62 8	65 5	65 4	64 1	59 2	56 6	51 0	58 3
1898... . . . .	47 6	56 3	52 9	59 7	56 6	63 4	64 5	65 6	64 8	64 6	57 6	53 1	58 9
1899.. . . .	54 2	54 4	54 0	56 4	54 0	62 4	64 4	64 0	65 5	59 6	57 4	54 3	58 4
1900 . . . . .	56 2	56 2	58 2	54 2	61 6	63 9	64 2	64 9	64 4	62 8	59 8	55 6	60 2
Mean (6 years) . . . . .	52 3	54 9	54 0	56 2	58 4	63 3	65 3	65 4	64 8	61 8	57 5	52 9	58 9



## CLIMATE OF SOUTHERN COAST.

61

## MAXIMUM AND MINIMUM TEMPERATURES (DEGREES FAHRENHEIT).

Month.	Absolute maxi- mum.		Absolute mini- mum.		Greatest daily range.	Means of three con- secutive warmest days.	Means of three con- secutive coldest days.
	Date.	Tempera- ture.	Date.	Tempera- ture.			
January .....	1899	81	1899	29	50	64.7	41.0
February .....	1899	86	1899	25	45	67.7	40.7
March .....	1899	89	1898	28	47	68.0	41.7
April .....	1898	97	1899	32	53	72.3	44.7
May .....	1896	98	1899	34	42	72.7	47.7
June .....	1895	99	1895	37	47	76.3	55.0
July .....	1896	99	1895	44	45	72.3	60.3
August .....	1900	106	1895	44	44	77.0	59.3
September .....	1898	100	1898	41	56	75.0	58.0
October .....	1896	98	1898	38	52	77.0	52.7
November .....	1898	94	1895	28	51	70.0	46.3
December .....	1900	84	1897	24	49	63.3	41.3
Annual .....	1900	106	1897	24	56	77.0	40.7

## WEATHER.

Month.	Average number of days—				Month.	Average number of days—			
	Clear.	Partly cloudy.	Cloudy.	Rainy.		Clear.	Partly cloudy.	Cloudy.	Rainy.
January .....	12	9	10	9	August .....	16	12	3	0
February .....	16	8	5	5	September .....	17	8	3	0
March .....	14	8	8	8	October .....	18	8	5	5
April .....	17	8	6	4	November .....	17	8	6	5
May .....	16	9	6	4	December .....	20	6	5	4
June .....	19	9	2	1	Annual .....	203	102	60	45
July .....	21	8	1	0					

CLIMATOLOGY OF CALIFORNIA.

ANNUAL METEOROLOGICAL SUMMARY FOR THE YEARS 1899 AND 1900 <sup>a</sup>

[ $\lambda=35^{\circ}18'N$  .  $\phi = 120^{\circ}39'W$  , gravity corr , - 0 08 ]

Date.	Pressure			Temperature								Moisture										
	Monthly mean	Extremes		Mean					Extremes		Dew-point		Relative humidity		Vapor pressure		Precipitation	Cloudiness				
		Maximum	Minimum	8 a m	8 p m	Maximum	Minimum	Monthly	Maximum	Minimum	8 a m	8 p m	8 a m	8 p m	8 a m	8 p m	Total	Maximum in 24 hours	8 a m	8 p m	Daylight	
1899	<i>In</i>	<i>In</i>	<i>In</i>	°	°	°	°	°	°	°	°	°	°	<i>Pct</i>	<i>Pct</i>	<i>In</i>	<i>In</i>	<i>In</i>	<i>In</i>			
January.....	29 92	30 15	29 46	47 9	59 8	65 4	43 0	54 2	81	29	38	42	72	54	0 238	0 270	5 56	2 36	2 0	3 6	3 5	
February....	29 91	30 25	29 61	47.8	60 0	67 6	41 1	54 4	86	25	33	39	60	49	0 189	0 241	0 28	0 27	1 0	1 7	2 5	
March.....	29 86	30 04	29 56	48 1	57 2	63 9	44 0	54 0	89	35	41	44	77	65	0 262	0 295	7 62	2 16	3 9	5 0	5 1	
April.....	29 80	29 98	29 65	48 5	60 6	69 1	43 6	56 4	86	32	42	48	80	64	0 269	0 335	1 54	1 38	1 9	3 1	4 0	
May.....	29 82	29 94	29 72	45 3	58 3	65 8	42 2	54 0	75	34	41	48	86	68	0 263	0 332	0 10	0 10	2 6	2 8	3 7	
June.....	29 78	29 90	29 56	52 3	68 3	75 0	49 9	62 4	90	42	49	52	88	59	0 344	0 397	0 92	0 92	3 2	1 1	3 4	
July.....	29 72	29 86	29 62	53 6	71 1	77 8	50 9	64 4	92	46	48	52	85	52	0 341	0 388	0 00	0 00	8 4	0 5	3 1	
August.....	29 73	29 80	29 64	54 3	67 3	75 4	52 7	64 0	88	47	49	52	84	59	0 356	0 391	0 00	0 00	6 9	1 3	3 8	
September..	29 75	29 88	29 64	53 0	68 7	80 8	50 2	65 5	99	44	48	53	86	58	0 342	0 400	0 00	0 00	4 2	1 0	2 8	
October....	29 78	30 02	29 41	50 0	63 8	71 9	47 3	59 6	96	40	45	49	83	60	0 298	0 350	3 92	1 36	2 1	2 0	3 2	
November..	29 83	30 00	29 55	51 0	60 3	67 3	47 5	57 4	77	37	46	52	83	73	0 314	0 386	1 94	0 88	3 5	5 4	5 8	
December..	29 89	30 18	29 70	47 9	59 2	65 7	42 9	54 3	80	38	38	44	71	59	0 231	0 291	4 51	2 56	2 1	3 7	3 6	
Year....	29 81	30 25	29 41	50 0	62 9	70 5	46 3	58 4	99	25	43	48	80	60	0 287	0 340	26 39	2 56	3 5	2 6	3 7	
1900																						
January.....	29 88	30 06	29 65	49 1	61 2	66 5	46 0	56 2	80	36	43	48	80	65	0 280	0 343	2 13	1 82	3 5	4 2	4 9	
February.....	29 88	30 08	29 54	46 8	60 9	69 0	43 5	56 2	80	34	39	45	75	58	0 240	0 303	0 16	0 16	1 6	2 8	3 2	
March.....	29 79	30 04	29 61	50 3	61 4	69 4	46 9	58 2	84	37	44	49	80	66	0 292	0 355	2 18	2 00	3 7	3 9	4 9	
April.....	29 79	29 95	29 58	45 8	58 3	64 7	43 6	54 2	80	34	41	45	84	61	0 261	0 301	0 98	0 54	4 7	3 5	4 5	
May.....	29 76	29 98	29 58	53 7	64 9	74 6	48 7	61 6	88	42	45	49	75	58	0 301	0 347	1 88	0 92	3 3	2 6	3 0	
June.....	29 73	29 88	29 58	54 8	68 1	76 5	51 3	63 9	93	45	49	52	82	57	0 347	0 387	0 01	0 01	4 7	2 6	3 9	
July.....	29 68	29 87	29 55	53 2	70 4	77 0	51 3	64 2	93	46	50	53	87	55	0 356	0 402	T	T	6 9	1 0	3 9	
August....	29 76	29 95	29 62	57 0	68 2	75 4	54 4	64 9	106	49	52	53	85	60	0 391	0 404	T	T	7 2	1 8	5 1	
September...	29 73	29 90	29 50	56 5	69 2	78 0	50 8	64 4	94	41	45	49	70	52	0 308	0 359	T	T	3 1	1 4	3 0	
October....	29 78	30 02	29 56	55 6	64 9	74 5	51 1	62 8	96	43	46	50	74	62	0 323	0 374	1 93	0 62	3 7	2 8	3 9	
November...	29 82	30 01	29 52	49 7	64 1	73 2	46 4	59 8	92	38	43	48	79	60	0 288	0 341	8 01	4 18	3 0	4 0	4 4	
December....	29 93	30 05	29 79	47.7	60 6	67 5	43 6	55.6	84	31	38	42	71	54	0 232	0 280	0 26	0 26	1 0	2 8	3 1	
Year.....	29 79	30 08	29 50	51 7	64 4	72 2	48 1	60 2	106	31	45	49	78	59	0 302	0 350	17 04	4 18	3 9	2 8	4 0	

<sup>a</sup> From observations at 8 a. m. and 8 p. m. 75th meridian time Local mean time 3 h. 3 m. slow

## CLIMATE OF SOUTHERN COAST.

63

## ANNUAL METEOROLOGICAL SUMMARY FOR THE YEARS 1899 AND 1900.

[H = 201 ft.;  $h_1$  = 111 ft.;  $h_2$  = 3 ft.;  $h_3$  = 46 ft.]

Date.	Wind.													Number of days.														
	By self-registers.				Number of winds, 8 a. m. and 8 p. m.									Precipitation.		Maximum temperature.						Electricity.						
	Average hourly velocity.	Prevailing direction.	Maximum velocity.	Direction at time of maximum velocity.	Number of days with gales.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calm.	Clear.	Partly cloudy.	Cloudy.	0.01 inch and over.	0.04 inch and over.	Snow.	Hail.		Fog.	Below 32°.	Above 32°.	Minimum temperature below 32°.	Thunderstorms.	Auroras.
1899.	Miles.	Miles.	Mi.																									
January .....	6.1	N.	32	SE.	0	29	1	1	2	14	0	8	6	1	18	4	9	7	7	0	0	1	0	0	3	0	0	
February .....	6.0	N.	22	N.	0	28	3	2	0	3	0	14	6	0	21	6	1	2	1	0	0	2	0	0	3	0	0	
March .....	6.6	N.	26	W.	0	22	0	0	5	14	1	16	4	0	13	5	13	10	9	0	0	2	0	0	0	0	0	
April.....	5.5	N.	25	N.	0	19	1.	0	2	8	1	17	10	2	15	12	3	8	8	0	1	2	0	0	0	0	0	
May.....	5.7	W.	22	W.	0	20	0	1	1	2	1	28	6	3	19	8	4	1	1	0	0	6	0	0	0	0	0	
June.....	4.8	W.	20	W.	0	6	2	3	1	8	1	25	13	1	19	8	3	1	1	0	0	10	0	1	0	0	0	
July.....	4.6	N.	21	N.	0	23	0	1	1	13	1	15	7	1	24	7	0	0	0	0	0	0	0	2	0	0	0	
August.....	4.9	W.	21	W.	0	11	0	2	1	8	0	33	5	2	15	12	4	0	0	0	0	0	0	0	0	0	0	
September....	4.4	N.	22	N.	0	25	0	3	0	7	0	15	8	2	22	7	1	0	0	0	0	6	0	4	0	0	0	
October.....	4.2	N.	16	W.	0	25	1	1	2	13	0	12	4	4	18	10	3	7	7	0	0	2	0	3	0	0	0	
November.....	4.2	N.	28	N.	0	26	1	2	1	12	0	11	7	0	7	11	12	9	8	0	0	4	0	0	0	0	0	
December.....	4.9	N.	22	S.	0	31	0	4	2	6	0	12	6	1	17	5	9	7	6	0	0	2	0	0	0	0	0	
Year.....	5.2	N.	32	SE.	0	265	9	20	18	108	5	206	82	17	208	95	62	47	43	0	1	37	0	10	6	0	0	
1900.																												
January .....	5.0	N.	22	N.	0	32	0	2	3	9	0	10	2	4	11	11	9	4	4	0	0	3	0	0	0	0	0	
February .....	5.6	N.	25	W.	0	27	0	4	0	1	1	15	6	2	18	9	1	2	1	0	0	3	0	0	0	0	0	
March .....	4.9	W.	24	W.	0	18	0	3	1	12	0	23	4	1	13	7	11	5	4	0	0	5	0	0	0	1	0	
April.....	5.7	W.	28	W.	0	11	0	4	0	8	0	31	2	4	15	6	9	6	5	0	0	1	0	0	0	1	0	
May.....	6.1	W.	20	W.	0	22	0	1	0	9	1	27	2	0	20	5	6	4	4	0	0	1	0	0	0	0	0	
June.....	5.1	W.	20	N.	0	16	0	1	1	11	1	24	4	2	15	9	6	1	0	0	0	5	0	1	0	1	0	
July.....	4.5	W.	16	W.	0	11	0	3	1	13	0	23	6	0	15	12	4	0	0	0	0	1	0	1	0	0	0	
August.....	5.2	W.	20	S.	0	5	0	3	0	15	1	35	2	1	8	15	8	0	0	0	0	0	0	2	0	0	0	
September....	5.1	W.	22	W.	0	16	0	3	1	4	1	26	3	6	18	8	4	0	0	0	0	1	0	5	0	0	0	
October.....	5.1	W.	23	N.	0	17	0	4	1	15	0	20	4	1	18	4	9	7	7	0	0	3	0	2	0	0	0	
November.....	4.5	N.	28	S.	0	34	0	0	0	11	0	9	3	3	14	9	7	6	6	0	0	3	0	1	0	0	0	
December.....	5.1	N.	27	N.	0	40	0	0	0	0	0	13	8	1	20	7	4	1	1	0	0	3	0	0	1	0	0	
Year.....	5.2	W.	28	S.	0	249	0	28	8	108	5	261	46	25	185	102	78	36	32	0	0	29	0	12	1	3	0	

## SANTA BARBARA

Santa Barbara is situated in latitude  $34^{\circ} 23'$  north and longitude  $119^{\circ} 40'$  west. In considering the entire coast line of California from Point St. George to San Diego one is struck by several marked changes of direction. The most noticeable bend occurs at Point Arguello, where the coast runs nearly due east to Santa Barbara and there bends southeast again with a short stretch running east and west between Point Dume and Santa Monica. Santa Barbara occupies a central position on that part of the coast of California which distinctively faces southward. Santa Barbara Channel, with a depth of water varying from 25 to 365 fathoms, lies between the mainland and San Miguel Island, Santa Rosa Island, Santa Cruz Island, and Anacapa Island. The Santa Ynez Mountains traverse this section of California running east and west, and embrace a number of valleys, the Santa Maria, Lompoc, Los Alamos, and Santa Ynez in the north and the Santa Barbara in the south. The city itself lies encircled by foothills except to the south, where it fronts the sea. Because of these topographical features the climatic conditions approach the ideal.

For many years temperature and rainfall records were maintained by the late Mr. Hugh D. Vail. At the request of the Santa Barbara Chamber of Commerce, Dr. C. Max Richter has carefully gone over these records and compiled the following data, covering a period of fifteen years for Santa Barbara. The records for a period of three years maintained at his own station—Pine Crest, Santa Barbara foothills—are also given. To illustrate the differences in rainfall existing within short distances where topographical conditions are so varied as they are here, Dr. Richter calls attention to the rainfall at Santa Barbara during the month of October, 1901. 2.42 inches of rain fell on October 26, while at Pine Crest, 2 miles away, 2.86 inches fell on the 26th, 0.66 of an inch on the 27th, and 0.03 inch on the 28th. The rainfall at the upper station, elevation 850 feet, exceeded that at the lower station, elevation 100 feet, in the ratio of 3 to 2.

The highest temperature recorded at Santa Barbara is  $107^{\circ}$  and the lowest  $28.5^{\circ}$ . The temperatures of winter and spring months approximate  $56^{\circ}$ ; summer and fall months  $63^{\circ}$ . The annual mean temperature is about  $60^{\circ}$ .

## THE CLIMATE OF SANTA BARBARA.

[By Dr. C. M. Richter.]

## Temperature.

Months.	Mean—										Absolute—		Mean of three consecutive		Mean number of days—				
	Monthly.	Maximum.	Minimum.	Warmest day.	Coldest day.	Three consecutive warmest days.	Three consecutive coldest days.	Daily range.	Greatest daily range.	Least daily range.	Maximum.	Minimum.	Mean of three consecutive highest maxima.	Mean of three consecutive lowest minima.	With 80° or above.	With 80° to 99.9°.	With 90° to 99.9°.	With 100° or above.	With 82° or below.
January .....	58.0	62.4	43.4	73.5	41.0	66.4	42.4	18.3	35.5	0.6	85.0	28.5	79.0	30.0	0.1	0.1	0.0	0.0	5.0
February .....	54.6	64.4	45.2	73.0	40.5	68.7	43.7	18.0	36.0	1.0	85.5	29.0	83.0	34.0	1.0	1.0	0.0	0.0	1.0
March .....	55.3	64.1	46.4	69.5	42.5	67.3	44.0	17.1	37.0	2.0	86.0	34.0	82.3	35.3	0.6	0.6	0.0	0.0	0.0
April .....	57.9	67.0	48.8	74.5	47.0	71.8	48.3	17.9	41.0	1.0	95.0	36.5	90.0	37.8	1.7	1.7	0.6	0.0	0.0
May .....	59.4	67.6	51.1	79.8	51.5	75.8	47.0	16.4	40.0	4.0	98.0	40.0	92.1	42.6	1.4	1.4	0.5	0.0	0.0
June .....	62.6	71.0	54.1	79.0	55.0	75.7	56.0	17.0	39.0	4.5	95.0	44.0	92.0	46.6	2.1	2.1	8.0	0.0	0.0
July .....	65.5	72.8	57.2	84.0	59.5	77.4	60.8	16.9	46.0	3.5	107.0	49.0	92.1	50.7	3.3	3.3	4.0	1.0	0.0
August .....	66.9	75.9	58.4	83.3	60.0	80.1	60.1	17.1	32.0	5.0	98.0	50.0	95.0	52.3	5.9	5.9	8.0	0.0	0.0
September .....	66.1	75.0	57.1	78.8	56.7	76.9	59.0	18.5	49.0	4.0	103.5	48.0	95.0	51.2	5.2	5.2	10.0	1.0	0.0
October .....	62.6	72.4	53.4	77.0	51.7	79.4	55.5	18.7	40.0	2.0	95.5	42.0	91.4	43.6	3.7	3.7	9.0	0.0	0.0
November .....	59.1	69.6	48.7	73.0	47.5	72.1	50.0	19.7	39.0	1.0	91.0	37.5	89.0	38.8	2.7	2.7	2.0	0.0	0.0
December .....	55.6	65.1	46.1	69.0	43.5	67.3	46.6	19.0	36.0	1.0	84.0	32.0	82.7	34.0	1.0	1.0	0.0	0.0	1.0
Annual .....	59.9	68.9	52.1	84.0	40.5	80.1	42.4	17.2	49.0	0.6	107.0	28.5	95.0	30.0	.....	.....	52.0	2.0	7.0
Winter .....	54.4	64.0	44.9	69.8	40.5	68.7	42.4	18.5	36.0	0.6	85.5	28.5	83.0	30.0	.....	.....	.....	.....	.....
Spring .....	57.5	66.2	48.8	75.0	42.5	75.8	44.0	17.1	41.0	1.0	98.0	34.0	92.1	35.3	.....	.....	11.0	.....	.....
Summer .....	65.0	73.2	56.6	83.8	55.0	80.1	56.0	17.0	46.0	3.5	107.0	44.0	95.0	46.6	.....	.....	20.0	.....	.....
Fall .....	62.6	72.3	53.1	63.5	47.5	79.4	50.0	19.1	49.0	1.0	103.5	37.5	91.4	38.8	.....	.....	21.0	.....	.....

## Temperature—Continued.

## Wind.

Months.	Mean number of days—							Mean number of days—							Mean direction of.	Greatest movement in one day.	Average velocity per hour.	Mean variability of temperature.	Precipitation.	Number of years observed.
	With 40° or below.	With minimum 32° to 39.5°.	With minimum 40° to 49.5°.	With maximum 70° to 79.5°.	Lowest absolute maxima.	Highest absolute minima.	Mean number days with highest absolute minimum 60° or above.	Number of days with frost.	Clear.	Partly cloudy.	Cloudy.	Rainy.	Mean relative humidity.							
January .....	8.0	6.0	20.0	4.2	48.0	62.0	0.0	98.0	19.8	3.7	8.2	4.9	67.1	W.	363	3.4	2.3	3.74	.....	
February .....	4.7	3.6	19.0	5.0	50.0	64.0	0.1	65.0	17.6	3.7	7.7	5.1	69.2	W.	386	4.0	2.2	3.32	.....	
March .....	3.5	2.9	16.0	5.0	48.5	58.0	0.0	27.0	17.8	4.5	8.6	5.3	70.0	W.	402	4.6	2.4	2.27	.....	
April .....	0.6	0.2	17.0	7.0	55.0	66.0	.....	2.0	20.7	3.1	6.1	2.6	71.0	W.	306	4.5	2.5	1.23	.....	
May .....	0.0	0.0	10.6	6.5	57.5	66.0	.....	0.0	15.5	5.0	9.6	2.3	73.1	W.	387	4.4	2.2	0.37	.....	
June .....	0.0	0.0	2.6	13.0	60.0	66.0	1.2	0.0	20.3	5.0	4.5	0.5	74.5	E.	330	4.7	2.1	0.09	.....	
July .....	0.0	0.0	0.0	22.0	65.0	66.0	6.0	0.0	23.6	5.4	1.9	0.1	75.9	E. W.	196	4.8	1.9	0.02	.....	
August .....	0.0	0.0	0.0	21.6	64.0	68.5	9.0	0.0	22.5	6.1	2.3	0.0	74.6	W.	152	4.0	1.7	T.	.....	
September .....	0.0	0.0	0.2	20.0	62.0	67.0	6.0	0.0	21.2	5.3	3.4	0.9	74.8	W.	258	3.7	2.1	0.13	.....	
October .....	0.0	0.0	5.2	13.5	60.0	64.0	2.0	0.0	19.6	6.0	5.3	2.4	72.1	W.	240	3.4	2.6	0.75	.....	
November .....	0.7	0.2	16.9	10.2	55.0	60.0	0.2	4.0	22.0	3.1	5.1	2.5	66.0	W.	365	3.2	2.5	1.59	.....	
December .....	4.0	2.6	20.4	5.4	52.0	62.0	0.0	5.6	20.0	3.0	7.1	5.5	65.1	W.	280	3.6	2.3	3.74	.....	
Annual .....	15.6	.....	.....	48.0	68.5	.....	.....	241.0	56.0	67.7	32.5	71.0	W.	402	4.0	2.3	17.19	.....		
Winter .....	.....	.....	.....	.....	.....	64.0	.....	.....	.....	.....	.....	.....	67.1	W.	386	.....	.....	.....	.....	
Spring .....	.....	.....	.....	.....	.....	66.0	.....	.....	.....	.....	.....	.....	71.4	W.	402	.....	.....	.....	.....	
Summer .....	.....	.....	.....	.....	.....	68.5	.....	.....	.....	.....	.....	.....	75.0	E. W.	331	.....	.....	.....	.....	
Fall .....	.....	.....	.....	.....	.....	67.0	.....	.....	.....	.....	.....	.....	71.0	W.	258	.....	.....	.....	.....	

## CLIMATOLOGY OF CALIFORNIA.

## MONTHLY AND ANNUAL PRECIPITATION (INCHES AND HUNDREDTHS)

Year.	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1868..	3 97	2 00	1 08	2 44	0 72	0 00	0 00	0 00	0 00	0 00	1 25	4 26	15.72
1869..	3 26	2 12	4 22	0 46	0 20	0 00	0 00	0 00	0 00	0 30	0 65	0 57	11 78
1870..	0 25	5 87	0 83	0 99	0 74	0 07	0 00	0 00	0 00	1 04	0 27	1 41	11 47
1871..	0 86	2 92	0 02	2 02	0 37	0 00	0 00	0 00	0 00	0 09	1 83	6 56	14 67
1872..	2 53	1 81	0 18	1 80	0 00	0 14	0 00	0 02	0 05	0 00	0 00	4 34	10 87
1873..	0 58	5 48	0 05	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 27	5 26	11 64
1874..	4 54	3 17	0 78	0 28	0 14	0 00	0 00	0 00	0 00	1 91	1 30	0 00	12 12
1875..	14 84	0 18	0 88	0 10	0 00	0 00	0 00	0 00	0 00	0 00	6 53	0 81	22 34
1876..	7 56	5 67	2 73	0 27	0 00	0 00	0 00	0 00	0 00	0 32	0 00	0 00	16 55
1877..	2 72	0 00	0 82	0 18	0 45	0 00	0 00	0 00	0 00	0 00	1 32	3 12	8 61
1878..	7 17	11 78	2 47	3 34	0 29	0 07	0 00	0 00	0 00	0 32	0 00	5 16	30 55
1879..	5 24	0 71	0 34	1 60	0 21	0 00	0 00	0 00	0 00	0 41	1 02	4 57	14 70
1880..	1 30	10 86	1 15	5 73	0 00	0 00	0 00	0 00	0 00	0 25	0 28	9 73	29 30
1881..	2 83	0 30	1 25	0 59	0 00	0 00	0 00	0 00	0 44	1 47	0 33	0 95	8 16
1882..	1 13	2 38	5 74	1 63	0 00	0 20	0 00	0 00	0 00	0 37	0 77	0 10	12 32
1883..	2 18	2 92	3 64	0 29	2 79	0 35	0 00	0 00	0 00	1 32	0 00	2 76	16 25
1884..	6 33	9 68	9 77	2 60	0 39	1 62	0 00	0 00	0 00	1 02	0 79	6 62	38 82
1885..	1 23	0 07	0 35	3 00	0 00	0 00	0 00	0 00	0 00	0 19	9 84	2 47	17.15
1886..	5 12	1 19	2 03	3 40	0 00	0 00	0 00	0 00	0 00	0 39	0 87	0 86	18 86
1887..	0 31	8 64	0 13	1 43	0 33	0 03	0 00	0 00	0 38	0 81	1 10	4.43	17 09
1888..	10 15	1 30	3 86	0 16	0 02	T	T	T	0 03	0 07	5 62	5.59	26 80
1889..	0 29	1 29	7 31	0 49	0 76	0 13	0 00	0 00	0 00	8 65	3 21	10 64	32 77
1890..	5 32	2 96	1 10	0 31	0 18	0 00	0 00	0 00	1 50	0.05	0 48	3 53	15 43
1891..	0 45	7 92	1 56	1 57	0 30	0 00	0 00	0 00	0 15	0 00	0 00	2 43	14 38
1892..	1 10	2 55	2 95	0 46	1 12	0 00	0 00	0 00	0 00	0.26	4 27	6.66	19 37
1893..	4 41	3 10	7 80	0 38	0 09	0 00	0 00	0 00	0 00	0 82	0 07	2 94	19 61
1894..	0 99	0 76	0 29	0 24	0 91	0 00	0 12	T	1 36	0 68	0 07	4 67	10 09
1895..	6 25	0 67	1 99	0 46	0 02	0 05	T	0 00	0 00	0 55	0 77	0 93	11 69
1896..	6 84	0 00	2 37	1 78	0 08	0 05	0 40	0 00	0 00	0 92	3 51	2 92	18 87
1897..	4 35	3 65	2 73	0 02	0 00	0 00	0 00	0 00	0 00	1 44	0 00	0 00	12 19
1898..	0 63	0 97	0 28	0 00	1 25	0 00	T	0 00	3 17	0 14	0 00	0 36	6 80
1899..	4 48	0 00	2 73	0 64	0 00	0 78	0 00	0 00	0 00	2.06	1 97	2 35	15 06
1900..	2 32	0 05	1 58	0 42	1 90	0 01	0 02	T	0 04	0 15	3 99	0 02	10 50
Mean of 33 years.....	3 68	3 12	2 26	1 18	0 40	0 11	0 02	T	0 22	0 77	1 61	3 23	16.59

## THE CLIMATE OF SANTA BARBARA FOOTHILLS—PINE CREST STATION.

[By Dr. C. M. Richter.]

Months.	Temperature.														
	Monthly.	Maximum.	Minimum.	Mean— Warmest day.	Coldest day.	Three consecutive warmest days.	Three consecutive coldest days.	Daily range.	Greatest daily range.	Least daily range.	Absolute. Maximum.	Minimum.	Mean of three consecutive highest maxima.	Mean of three consecutive lowest minima.	Mean number of days—
															With 80° or above.
															With 80° to 89° 5.
															With 90° to 99° 5.
															With 100° or above.
															With 32° or below.
January.....	55.4	61.8	49.0	70.0	42.0	69.2	42.5	12.7	22.0	4.0	79.0	34.0	75.7	35.3	0.0
February.....	58.0	66.1	50.0	74.0	39.5	72.0	41.7	16.0	28.0	2.0	82.0	31.0	79.3	33.0	0.6
March.....	57.4	65.6	49.1	76.5	45.5	74.3	46.2	16.1	28.0	3.0	86.0	37.0	83.7	38.0	1.7
April.....	59.3	68.8	49.8	85.0	45.5	83.7	49.0	18.9	34.0	9.0	95.0	39.0	94.7	42.7	4.3
May.....	59.4	68.5	50.3	77.5	51.0	74.2	53.3	17.1	31.0	6.0	87.0	40.0	78.7	46.0	3.0
June.....	64.4	74.4	54.5	82.5	54.0	79.5	54.8	18.8	34.0	7.0	93.0	46.0	91.7	48.0	7.0
July.....	68.1	79.2	56.9	87.5	57.5	84.2	59.8	22.2	32.0	11.0	99.0	50.0	95.3	50.7	13.3
August.....	68.9	78.1	58.1	87.0	59.5	82.7	61.0	21.4	33.0	9.0	99.0	51.0	93.3	52.0	11.3
September.....	69.9	79.7	60.1	90.0	60.0	86.8	61.5	19.2	34.0	10.0	101.0	49.0	97.3	52.0	15.0
October.....	64.8	72.4	55.3	84.5	52.5	82.8	54.0	17.0	29.0	4.0	93.0	46.0	92.0	47.7	6.3
November.....	64.7	71.8	55.6	80.5	52.0	79.5	52.2	16.1	25.0	5.0	91.0	43.0	89.0	46.0	5.7
December.....	58.4	65.5	51.4	73.0	46.0	72.5	46.8	13.7	23.0	3.0	83.0	39.0	82.0	40.0	1.7
Annual.....	62.3	71.0	53.3	90.0	39.5	86.8	41.7	17.4	34.0	2.0	101.0	31.0	97.3	33.0	5.8
Winter.....	57.3	64.5	50.1	74.0	39.5	72.5	41.7	14.1	28.0	2.0	83.0	31.0	82.0	33.0	7.0
Spring.....	59.7	67.6	49.7	85.0	45.5	83.7	46.2	17.3	34.0	3.0	95.0	37.0	91.7	38.0	2.7
Summer.....	66.8	77.2	56.5	87.5	54.0	84.2	54.8	20.8	34.0	7.0	99.0	46.0	95.3	48.0	9.5
Fall.....	63.3	74.6	57.0	90.0	52.0	86.8	52.2	17.4	34.0	4.0	101.0	43.0	97.3	46.0	8.1

Months.	Temperature.										Mean number of days—				Wind.			
	With 40° or below.	With minimum 32° to 39° 5.	With minimum 40° to 49° 5.	With maximum 70° to 79° 5.	Lowest absolute maximum.	Highest absolute minimum.	Mean number of days with highest absolute maximum 60° or above.	Number of days with frost.	Clear.	Partly cloudy.	Cloudy.	Rainy.	Mean relative humidity.	Mean direction.	Greatest movement in one day.	Average velocity per hour.	Precipitation.	Number of years observed
January.....	3.0	2.3	16.3	6.3	64.0	47.0	4.0	0.7	17.3	6.3	7.0	3.0	62.3	N.	278	4.7	2.99	.....
February.....	2.3	1.7	13.3	10.0	66.0	49.0	3.3	0.0	20.0	4.0	4.0	1.3	52.2	N.	346	4.7	0.55	.....
March.....	2.3	1.7	16.7	7.7	68.0	52.0	3.0	0.0	17.3	8.0	4.0	5.0	67.2	N.	312	4.9	2.28	.....
April.....	0.7	0.3	21.0	6.7	78.0	52.0	3.7	0.0	16.7	6.0	7.0	3.0	68.8	N.	281	4.7	0.54	.....
May.....	0.3	0.0	17.3	8.0	73.0	58.0	2.0	0.0	21.0	4.7	5.0	2.1	68.7	N.	359	3.9	1.77	.....
June.....	0.0	0.0	2.7	14.7	76.0	58.0	4.7	0.0	22.3	5.1	3.0	0.6	72.0	S.	252	3.1	0.08	.....
July.....	0.0	0.0	0.0	17.3	73.0	65.0	3.0	0.0	26.7	4.0	0.0	1.0	70.6	S.	186	2.9	0.04	.....
August.....	0.0	0.0	0.0	17.0	73.0	64.0	11.0	0.0	25.7	3.1	2.0	0.0	72.0	S.	197	2.8	0.00	.....
September.....	0.0	0.0	0.3	13.0	81.0	67.0	13.7	0.0	23.7	3.0	3.0	1.0	59.7	S.	323	3.5	0.48	.....
October.....	0.0	0.0	1.7	12.7	76.0	58.0	7.7	0.0	20.0	6.0	5.0	4.0	61.3	S. N.	359	3.9	1.21	.....
November.....	0.0	0.0	5.3	13.0	72.0	55.0	8.7	0.0	23.0	4.0	4.0	2.8	60.5	N.	299	4.5	2.42	.....
December.....	1.3	1.3	11.3	7.0	64.0	53.0	5.0	0.0	23.3	2.0	6.0	1.2	46.8	N.	222	5.0	0.65	.....
Annual.....	7.0	7.3	8.8	11.1	81.0	47.0	.....	.....	25.0	60.0	51.0	2.4	63.5	.....	359	4.0	13.08	.....
Winter.....	10.3	5.3	4.1	23.3	66.0	47.0	.....	.....	.....	.....	.....	.....	53.0	N.	346	.....	.....	.....
Spring.....	3.3	1.7	5.5	22.3	73.0	52.0	.....	.....	.....	.....	.....	.....	68.0	N.	359	.....	.....	.....
Summer.....	0.0	0.0	2.7	49.0	73.0	58.0	.....	.....	.....	.....	.....	.....	71.0	S.	252	.....	.....	.....
Fall.....	0.0	0.0	7.3	38.7	81.0	55.0	.....	.....	.....	.....	.....	.....	60.0	S. N.	359	.....	.....	.....

## LOS ANGELES.

By MR. G. E. FRANKLIN, Local Forecaster.

Los Angeles City is located in a valley of the same name, 18 miles from the Pacific Ocean. Its chief topographical feature is a range of hills of moderate elevation on the western side, with a general trend north to south, which separates it from the Cahuenga Valley, that extends to the ocean on the west. The eastern side is slightly undulating and broadens out into the Los Angeles Valley, which reaches the ocean on the south.

A great variety of climate may be found within a small radius. A traveler may start from the ocean at Santa Monica, Redondo, Long Beach, or other seaside places in the morning and within two or three hours' ride by rail and cable railway attain an altitude of 2,000 feet, whence by trails he can ascend to 6,000 feet.

The rain storms do not last usually more than two or three days at a time; occasionally they continue a week, and are followed by periods of fine weather lasting two or three weeks. An average of three hundred and seventeen clear days, or days when the sun is but partly obscured, is the record for the past twenty-three and a half years; the sunshine averages 75 per cent. The first rains wash the atmosphere of the summer's dust, when the sky becomes beautifully clear; the later rains are heavier and snow falls in the mountains, though a light fall may occur with the first rain.

The prevailing wind is west, which, coming from the ocean, causes the humidity to average quite high. The nights as a rule are cool and damp and the days warm and dry, or moderately so. Morning fogs are frequent from spring to autumn, but they disappear in the early forenoon.

During heavy fogs the air is so saturated with moisture that it is not uncommon to find a precipitation of one-hundredth of an inch in the gauge. On the other hand, the humidity falls as low as 9 per cent during "northers," which occasionally occur in the summer and autumn months. These "northers" last from one to five days, usually three, and are accompanied by high temperature, which is so modified by the dryness of the air as to be neither oppressive nor debilitating.

In consulting the accompanying temperature tables it should be borne in mind that the instruments from which the data were obtained were located on roofs of buildings, 60 to 70 feet above ground, exposed in standard shelters and above the stratum of colder air which settles on low ground. The temperature so obtained is appreciably different from that on the surface, lower maxima and higher minima resulting. For the above reasons the temperature seldom falls to freezing or below at the Weather Bureau station, while in the low grounds it frequently reaches 32° or several degrees below in winter, when a much higher temperature obtains at the station; this corresponds to the foothill belts, where frost seldom if ever happens. Frost occurs in the low sections of the city when in the hill portions there is not the least trace, and where delicate flowers, such as calla lillies, may be seen in full flower.



## MEAN MONTHLY AND ANNUAL TEMPERATURE (DEGREES FAHRENHEIT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1877.....							73	71	71	64	63	57	-----
1878.....	55	55	57	59	63	67	70	71	70	65	59	55	62
1879.....	58	56	59	60	62	68	69	72	69	66	57	53	62
1880.....	54	51	52	57	63	66	65	69	66	63	56	56	60
1881.....	53	59	57	63	64	67	72	71	70	61	57	55	62
1882.....	50	51	56	58	64	66	71	73	70	63	58	57	61
1883.....	53	52	58	58	64	71	73	72	74	62	60	56	63
1884.....	54	56	56	59	63	68	73	73	87	63	61	53	62
1885.....	55	57	62	63	66	67	72	75	71	66	60	58	64
1886.....	55	60	55	59	65	69	72	75	68	60	57	56	68
1887.....	55	51	60	60	64	68	72	70	69	66	60	53	62
1888.....	50	54	56	63	63	69	73	73	74	66	60	57	68
1889.....	52	56	59	62	63	66	71	72	73	66	61	55	63
1890.....	49	54	58	59	63	68	73	73	71	68	66	61	64
1891.....	56	53	58	59	62	66	74	75	73	66	61	53	63
1892.....	57	54	56	59	62	64	68	72	68	64	62	54	62
1893.....	57	55	54	58	63	66	70	71	66	63	57	58	62
1894.....	51	51	54	59	60	63	67	70	69	66	59	54	63
1895.....	52	57	56	59	64	66	68	69	69	66	60	56	62
1896.....	58	60	58	56	63	69	71	71	68	65	60	59	63
1897.....	56	53	53	61	63	66	70	72	70	62	62	56	62
1898.....	52	58	55	63	60	67	70	74	71	65	61	57	68
1899.....	56	54	57	60	60	65	70	69	70	63	62	58	62
1900.....	58	58	60	57	64	67	71	68	67	64	66	60	64
Average.....	54	55	57	60	63	67	71	72	70	64	60	56	62

## MAXIMUM TEMPERATURE (DEGREES FAHRENHEIT).

1877.....							93	87	93	80	86	81	93
1878.....	72	71	76	80	89	81	88	89	103	91	81	88	108
1879.....	74	80	99	88	97	104	84	98	101	96	84	76	104
1880.....	76	70	74	83	97	88	85	92	91	89	85	80	97
1881.....	71	86	89	94	89	88	96	100	102	82	81	79	102
1882.....	74	77	88	80	86	87	98	99	100	88	81	82	100
1883.....	82	82	84	89	100	100	90	98	104	83	84	80	104
1884.....	78	81	72	80	79	98	99	102	92	89	88	76	102
1885.....	72	81	85	89	80	90	98	106	108	102	78	82	108
1886.....	75	81	76	80	89	92	98	98	91	82	85	85	98
1887.....	80	82	85	87	92	100	98	94	91	93	86	78	100
1888.....	71	74	79	99	83	94	95	97	98	98	84	79	99
1889.....	71	84	81	93	94	81	99	95	103	89	82	68	103
1890.....	67	81	81	94	96	105	97	98	94	99	96	82	105
1891.....	80	71	82	86	74	89	109	96	100	89	85	75	109
1892.....	81	74	81	88	99	88	90	94	95	96	90	81	99
1893.....	84	79	88	84	90	90	89	92	90	91	80	88	92
1894.....	75	78	82	85	80	83	88	97	99	96	92	75	99
1895.....	77	84	84	82	88	100	85	88	97	91	94	86	100
1896.....	87	88	89	81	103	99	92	91	92	90	84	84	103
1897.....	79	88	76	90	76	88	86	96	97	83	92	89	97
1898.....	84	85	81	99	80	95	91	96	99	91	94	83	99
1899.....	82	82	90	92	76	89	93	89	95	100	86	82	100
1900.....	81	84	90	76	87	89	95	93	94	88	96	85	96

# CLIMATOLOGY OF CALIFORNIA.

## MINIMUM TEMPERATURE (DEGREES FAHRENHEIT).

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1877	37	41	41	42	47	47	55	56	52	43	45	36	36
1878	36	39	42	42	43	50	52	53	47	42	37	30	30
1879	30	34	36	40	42	50	52	52	44	44	35	38	30
1880	37	42	37	43	41	48	51	52	50	43	34	35	31
1881	33	32	35	40	42	50	52	57	46	44	36	35	32
1882	30	28	43	39	40	52	52	50	53	44	42	37	28
1883	34	38	37	42	47	50	52	52	46	43	39	36	31
1884	38	36	42	45	49	47	52	51	51	42	40	40	36
1885	32	41	37	42	44	48	50	54	48	41	31	37	32
1886	33	35	41	40	44	47	51	52	49	47	39	35	33
1887	31	39	36	44	45	50	49	51	55	44	40	41	31
1888	32	33	44	46	46	51	54	58	52	50	43	40	32
1889	34	35	40	42	43	48	55	56	54	46	41	33	34
1890	34	33	40	42	47	49	54	54	52	46	40	33	33
1891	37	38	36	40	42	46	50	53	50	40	41	35	35
1892	35	38	31	39	45	48	50	54	48	46	39	37	31
1893	32	35	35	41	46	46	51	52	49	45	38	39	32
1894	37	36	38	41	47	47	54	51	48	45	30	34	31
1895	37	36	38	41	47	47	54	51	48	45	30	34	31
1896	36	36	35	38	44	48	54	54	50	47	37	32	35
1897	37	35	38	40	48	50	56	56	48	45	41	34	30
1898	31	40	36	41	46	50	53	53	51	45	43	37	33
1899	37	33	39	42	44	50	53	53	51	45	43	37	33
1900	41	40	40	40	47	52	53	51	49	47	48	37	37

## MEAN DAILY RANGE IN TEMPERATURE (DEGREES FAHRENHEIT).

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1877	18	16	18	16	17	18	21	22	23	19	24	19	20
1878	18	17	20	18	24	20	22	24	25	25	23	17	21
1879	22	21	22	16	26	20	18	21	22	24	24	15	21
1880	20	21	23	19	22	26	28	28	29	25	27	23	24
1881	18	22	21	24	25	24	26	26	28	26	23	26	21
1882	22	21	17	24	24	27	25	28	27	22	25	22	24
1883	22	16	16	19	18	21	28	27	26	28	25	17	22
1884	21	25	25	22	22	27	27	28	28	27	19	20	21
1885	17	23	20	20	27	24	29	29	25	24	27	22	21
1886	25	18	26	21	26	27	25	25	24	26	23	21	21
1887	16	18	18	22	20	26	28	28	20	22	20	19	22
1888	22	25	20	22	22	20	25	25	24	20	23	12	22
1889	17	21	22	20	18	23	25	22	22	29	30	19	22
1890	25	17	20	23	16	23	25	24	25	24	27	21	22
1891	24	16	19	25	19	24	24	22	25	24	25	19	22
1892	25	21	18	22	21	25	25	23	23	24	23	22	23
1893	22	21	22	22	20	22	26	23	25	25	27	16	23
1894	17	22	20	21	21	23	21	23	28	21	25	25	22
1895	20	23	22	21	23	22	21	22	24	23	21	22	22
1896	19	18	18	24	16	21	21	22	22	20	23	27	21
1897	19	22	23	23	18	21	22	24	26	27	27	24	23
1898	21	24	19	22	19	19	24	21	25	22	22	24	22
1899	22	25	20	20	21	20	21	19	21	21	24	25	22
1900	21	21	20	21	21	23	24	24	25	24	24	21	22

## CLIMATE OF SOUTHERN COAST.

71

## GREATEST AND LEAST DAILY RANGES IN TEMPERATURE (DEGREES FAHRENHEIT).

	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.													
Year.	Greatest.	Least.	Greatest.	Least.	Greatest.	Least.	Greatest.	Least.	Greatest.	Least.	Greatest.	Least.	Greatest.	Least.	Annual.										
1877.....							80	13	29	15	33	12	29	12	35	14	31	5	.....						
1878.....	25	9	23	7	28	8	30	7	32	7	28	8	28	15	26	16	40	14	44	12	41	11	36	7	.....
1879.....	31	6	31	6	38	6	36	9	38	14	38	10	28	14	32	16	36	14	43	11	36	10	33	4	.....
1880.....	32	13	34	6	34	10	30	3	34	10	32	9	32	11	34	12	39	13	40	11	36	10	27	7	.....
1881.....	29	5	32	8	40	7	40	7	39	10	38	12	40	20	37	19	45	19	37	7	37	13	34	11	.....
1882.....	28	8	31	9	36	7	34	5	40	12	35	12	39	19	37	10	36	13	36	10	37	9	39	13	.....
1883.....	37	8	33	8	29	6	35	12	43	10	44	14	34	18	38	22	40	17	36	10	38	12	32	4	.....
1884.....	37	6	30	6	28	5	30	4	28	10	40	5	42	18	38	17	37	12	37	8	39	11	32	6	.....
1885.....	31	11	35	14	38	12	37	8	28	15	40	16	42	16	42	17	48	16	44	15	36	3	28	7	.....
1886.....	28	6	33	9	29	12	36	10	39	12	39	10	40	20	37	14	40	14	39	8	39	14	37	10	.....
1887.....	38	16	31	8	36	10	36	5	39	13	47	13	40	12	35	12	37	11	40	14	37	8	35	13	.....
1888.....	30	5	30	5	30	8	43	9	33	10	41	15	40	20	39	15	38	13	39	6	39	6	28	5	.....
1889.....	34	6	35	8	31	9	39	10	35	13	27	18	37	17	34	18	41	13	32	8	33	8	21	5	.....
1890.....	25	9	32	7	33	6	40	8	37	7	36	13	33	17	34	13	35	8	49	8	39	11	29	3	.....
1891.....	34	13	28	4	30	7	37	11	26	8	33	14	39	17	35	18	38	11	43	7	39	13	34	7	.....
1892.....	31	8	30	6	31	8	38	16	41	7	30	10	34	16	32	13	36	14	40	8	39	7	30	5	.....
1893.....	37	5	33	4	31	6	33	7	34	8	36	13	35	16	31	16	35	12	40	11	38	7	40	7	.....
1894.....	34	10	33	8	40	5	33	12	32	10	37	13	35	17	32	15	44	12	38	12	42	16	31	3	.....
1895.....	27	5	34	7	35	6	32	7	35	8	38	15	28	13	33	12	41	18	41	10	42	5	33	14	.....
1896.....	39	6	39	12	32	8	33	14	35	11	38	12	30	12	29	15	36	13	35	8	30	6	34	12	.....
1897.....	29	8	31	6	31	10	35	5	26	6	35	14	28	14	31	14	32	9	31	5	34	12	38	15	.....
1898.....	32	7	35	6	35	9	41	8	30	10	42	9	34	15	34	15	42	8	38	13	37	13	34	10	.....
1899.....	32	6	36	5	37	7	43	13	27	8	32	11	37	16	32	13	37	11	40	9	38	4	32	8	.....
1900.....	34	5	36	11	35	7	31	10	33	10	36	8	33	13	27	11	38	12	32	11	34	6	34	18	.....

## NUMBER OF DAYS TEMPERATURE WAS ABOVE 90° F.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1877.....							3	0	1	0	0	0	4
1878.....	0	0	0	0	0	0	0	0	4	1	0	0	5
1879.....	0	0	1	0	2	3	0	2	4	6	0	0	18
1880.....	0	0	0	0	1	0	0	0	1	0	0	0	2
1881.....	0	0	0	1	0	0	5	4	7	0	0	0	17
1882.....	0	0	0	0	0	0	3	5	2	0	0	0	10
1883.....	0	0	0	0	3	6	0	8	10	0	0	0	27
1884.....	0	0	0	0	0	2	5	7	1	0	0	0	15
1885.....	0	0	0	0	0	1	7	11	5	2	0	0	26
1886.....	0	0	0	0	0	4	9	13	1	0	0	0	27
1887.....	0	0	0	0	2	2	3	3	2	5	0	0	17
1888.....	0	0	0	2	0	3	6	8	9	2	0	0	30
1889.....	0	0	0	1	1	0	5	5	8	0	0	0	20
1890.....	0	0	0	1	1	5	5	5	5	6	4	0	32
1891.....	0	0	0	0	0	0	9	5	9	0	0	0	23
1892.....	0	0	0	0	3	0	1	4	1	3	0	0	12
1893.....	0	0	0	0	1	0	0	4	1	2	0	0	8
1894.....	0	0	0	0	0	0	0	3	4	3	1	0	11
1895.....	0	0	0	0	0	1	0	0	7	1	2	0	11
1896.....	0	0	0	0	3	3	1	1	1	0	0	0	9
1897.....	0	0	0	0	0	0	0	5	5	0	1	0	11
1898.....	0	0	0	5	0	3	1	8	8	1	2	0	28
1899.....	0	0	0	2	0	0	3	0	3	2	0	0	10
1900.....	0	0	0	0	0	0	5	1	2	0	6	0	14

## CLIMATOLOGY OF CALIFORNIA.

## NUMBER OF DAYS TEMPERATURE WAS BELOW 32° F

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1877.							0	0	0	0	0	0	0
1878.	0	0	0	0	0	0	0	0	0	0	0	1	1
1879	0	0	0	0	0	0	0	0	0	0	0	1	1
1880.	1	0	0	0	0	0	0	0	0	0	0	0	1
1881.	0	0	0	0	0	0	0	0	0	0	0	0	0
1882.	0	0	0	0	0	0	0	0	0	0	0	0	0
1883.	1	2	0	0	0	0	0	0	0	0	0	0	3
1884	0	0	0	0	0	0	0	0	0	0	0	0	0
1885.	0	0	0	0	0	0	0	0	0	0	0	0	0
1886	0	0	0	0	0	0	0	0	0	0	0	0	0
1887	0	0	0	0	0	0	0	0	0	0	0	0	0
1888	4	0	0	0	0	0	0	0	0	0	0	0	4
1889	0	0	0	0	0	0	0	0	0	0	0	0	0
1890.	0	0	0	0	0	0	0	0	0	0	0	0	0
1891	0	0	0	0	0	0	0	0	0	0	0	0	0
1892.	0	0	0	0	0	0	0	0	0	0	0	0	0
1893	0	0	1	0	0	0	0	0	0	0	0	0	1
1894	0	0	0	0	0	0	0	0	0	0	0	0	0
1895	0	0	0	0	0	0	0	0	0	0	0	0	0
1896.	0	0	0	0	0	0	0	0	0	0	0	0	0
1897..	0	0	0	0	0	0	0	0	0	0	0	1	1
1898	1	0	0	0	0	0	0	0	0	0	0	0	1
1899	0	0	0	0	0	0	0	0	0	0	0	0	0
1900	0	0	0	0	0	0	0	0	0	0	0	0	0

## MEAN RELATIVE HUMIDITY (PER CENT).

1877							64	63	64	67	45	57	
1878	62	70	74	71	72	73	71	70	62	60	58	48	66
1879	64	74	71	65	62	65	70	68	81	53	71	71	64
1880	64	67	76	73	73	67	74	74	71	65	56	71	69
1881.	65	63	65	71	70	69	67	69	67	70	51	64	66
1882	70	63	65	72	66	68	67	66	67	63	59	55	65
1883.	53	61	80	68	72	72	73	71	67	69	60	64	67
1884.	62	71	76	79	76	76	72	73	72	72	71	77	73
1885.	65	66	66	70	75	69	71	70	70	78	74	72	71
1886	78	76	81	80	74	76	73	77	82	80	67	79	77
1887	66	82	78	79	73	78	88	81	82	73	74	74	77
1888	80	83	78	75	79	74	76	79	78	82	71	71	78
1889	60	54	77	78	74	78	74	73	64	75	58	45	71
1890.	70	66	64	76	73	66	69	73	72	61	40	56	65
1891.	48	70	70	72	78	73	73	75	69	75	73	58	70
1892.	60	80	79	71	75	72	76	74	79	69	64	72	73
1893	69	73	79	71	75	74	76	77	77	73	74	63	78
1894	70	68	70	74	80	74	76	78	73	75	84	77	75
1895	76	69	77	74	76	73	80	80	68	82	60	57	73
1896.	71	58	70	67	67	73	79	77	76	77	72	66	71
1897.	68	74	74	73	82	77	78	74	76	73	60	53	72
1898.	65	71	62	68	77	76	75	71	68	72	57	52	68
1899	65	68	72	76	76	81	76	77	75	72	73	61	73
1900.	75	63	73	73	78	79	74	76	68	78	57	55	71
Averages	66	69	73	73	74	73	74	74	72	71	64	65	71

## CLIMATE OF SOUTHERN COAST.

73

## HIGHEST AND LOWEST MEAN RELATIVE HUMIDITY (PER CENT).

Year.	Jan.		Feb.		Mar.		Apr.		May.		June.		July.		Aug.		Sept.		Oct.		Nov.		Dec.	
	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.
1877.....													78	42	78	51	77	31	78	46	78	17	85	14
1878.....	90	29	92	40	84	48	80	49	79	53	77	63	75	61	75	57	76	14	79	24	86	27	89	16
1879.....	84	24	88	50	83	24	85	23	75	15	75	21	76	62	76	47	79	23	81	16	86	25	89	21
1880.....	85	38	82	45	85	59	89	57	84	35	82	49	80	64	83	56	83	20	85	18	80	11	87	34
1881.....	87	38	85	27	85	43	92	49	84	57	75	56	94	51	77	48	76	49	86	59	75	34	78	40
1882.....	86	57	85	46	91	36	91	56	88	43	74	59	81	55	78	51	89	52	88	26	84	28	89	27
1883.....	79	28	95	30	95	45	86	26	82	23	81	55	77	65	79	57	82	28	84	48	81	23	95	34
1884.....	95	25	94	36	93	51	95	64	87	67	90	56	80	63	80	42	86	50	89	28	85	37	95	47
1885.....	89	30	87	29	81	25	86	36	82	67	78	52	78	55	82	48	90	27	87	54	93	42	91	42
1886.....	95	39	92	46	90	67	92	66	84	66	84	60	84	56	82	66	87	71	90	66	86	42	94	56
1887.....	86	43	92	58	94	43	92	48	84	48	84	61	89	70	88	65	89	73	90	43	90	52	96	46
1888.....	98	48	93	61	94	47	88	31	88	68	84	57												

The following table shows the actual and possible number of hours of sunshine and percentages of each month at Los Angeles, Cal., from October, 1896, to December, 1900, inclusive. The record is derived from the Weather Bureau photographic sunshine recorder, which forms a portion of the standard equipment of instruments at the Los Angeles Station.

## TOTAL NUMBER OF HOURS OF ACTUAL SUNSHINE.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Monthly average.
1896.....										271	226	222	.....
1897.....	209	198	261	314	216	327	332	344	291	246	274	262	273
1898.....	205	216	290	292	278	294	365	354	303	294	237	226	284
1899.....	238	260	240	289	287	289	370	324	289	258	214	214	273
1900.....	204	255	229	242	308	282	331	280	297	254	239	275	267

## TOTAL NUMBER OF HOURS OF POSSIBLE SUNSHINE.

All years.....	316	307	372	392	433	432	440	416	372	351	312	308	371
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## PERCENTAGE OF SUNSHINE.

1896.....										77	72	72	.....
1897.....	66	65	70	80	50	76	75	83	73	70	84	85	74
1898.....	65	70	78	74	64	68	83	85	81	84	92	78	77
1899.....	75	85	65	74	66	67	84	78	78	73	69	70	74
1900.....	64	83	61	62	71	65	75	69	80	72	77	89	72

## CLIMATOLOGY OF CALIFORNIA.

## NUMBER OF CLEAR, PARTLY CLOUDY, AND CLOUDY DAYS.

Year.	January			February			March			April			May			June		
	Clear	Partly cloudy	Cloudy	Clear	Partly cloudy	Cloudy	Clear	Partly cloudy	Cloudy	Clear	Partly cloudy	Cloudy	Clear	Partly cloudy	Cloudy	Clear	Partly cloudy.	Cloudy
1878	13	10	8	13	6	9	7	18	6	8	13	9	11	10	10	3	15	12
1879	16	10	5	6	13	9	16	5	10	13	12	5	22	9	0	3	21	3
1880	20	10	1	16	8	5	16	10	5	8	10	12	15	11	5	7	22	1
1881	17	9	5	14	12	2	15	13	3	6	13	11	9	15	7	12	16	2
1882	18	6	7	16	9	3	15	5	11	16	9	5	12	11	8	11	11	5
1883	21	6	4	13	9	6	6	14	11	10	18	2	12	15	4	15	12	3
1884	17	8	6	11	8	10	9	11	11	11	13	6	7	16	8	8	9	13
1885	<sup>a</sup> 17	<sup>a</sup> 10	<sup>a</sup> 3	16	11	1	14	12	5	11	12	7	4	21	8	15	11	1
1886	13	6	12	20	4	4	14	11	6	13	10	7	14	14	3	<sup>a</sup> 10	<sup>a</sup> 16	<sup>a</sup> 3
1887	21	0	0	13	9	6	18	12	1	11	10	9	<sup>a</sup> 14	<sup>a</sup> 11	<sup>a</sup> 5	17	10	3
1888	14	8	9	14	8	7	10	12	9	14	8	8	5	18	8	17	12	1
1889	19	6	6	18	8	2	9	18	4	12	13	5	9	19	3	1	28	1
1890	10	13	8	15	9	4	18	13	5	6	20	4	5	18	8	9	21	0
1891	18	11	2	10	7	11	14	10	7	10	13	7	4	20	7	15	14	1
1892	14	9	8	6	10	13	11	17	3	17	11	2	10	6	15	12	17	1
1893	17	7	7	13	10	5	8	13	10	19	9	2	10	14	7	16	14	0
1894	21	6	4	11	14	3	12	11	8	10	14	6	5	20	6	10	20	0
1895	13	14	4	13	9	6	11	9	11	10	10	10	9	19	8	9	21	0
1896	9	14	8	21	5	3	9	15	7	11	16	8	14	16	1	9	21	0
1897	13	13	5	11	11	6	11	13	7	16	12	2	2	22	7	10	20	0
1898	12	10	9	11	12	5	15	14	2	15	12	3	8	18	5	6	22	2
1899	16	8	7	14	12	2	8	18	5	7	22	1	8	19	4	7	20	3
1900	10	14	7	15	13	0	11	10	10	11	15	4	12	16	3	9	18	3
Averages	16	9	6	13	9	6	12	12	7	12	12	6	10	15	6	10	17	3

Year	July			August			September			October			November			December			Annual.		
	Clear	Partly cloudy	Cloudy	Clear	Partly cloudy	Cloudy	Clear	Partly cloudy	Cloudy	Clear	Partly cloudy	Cloudy	Clear	Partly cloudy	Cloudy	Clear	Partly cloudy.	Cloudy.	Clear	Partly cloudy.	Cloudy
1877	19	11	1	22	8	1	16	11	3	18	11	2	22	7	1	18	7	6	...	...	...
1878	5	26	0	10	19	2	15	14	1	17	13	1	17	11	2	22	4	5	141	159	65
1879	13	8	0	17	14	0	18	12	0	19	9	3	17	10	3	13	10	8	178	146	46
1880	5	23	3	12	16	3	6	23	0	9	16	6	17	12	1	10	10	11	141	171	54
1881	11	19	1	12	18	1	17	11	2	19	9	3	25	5	0	15	14	2	172	154	39
1882	9	22	0	<sup>a</sup> 16	<sup>a</sup> 6	<sup>a</sup> 1	26	2	2	20	9	2	16	8	6	22	8	1	<sup>a</sup> 197	<sup>a</sup> 109	<sup>a</sup> 51
1883	11	19	1	20	10	1	22	8	0	13	14	4	18	11	1	22	7	2	183	43	39
1884	24	7	0	23	8	0	20	8	2	25	4	2	21	7	2	<sup>a</sup> 13	<sup>a</sup> 11	<sup>a</sup> 6	189	110	66
1885	14	16	1	16	14	1	18	12	0	21	10	0	14	8	8	21	5	5	<sup>a</sup> 181	<sup>a</sup> 145	<sup>a</sup> 88
1886	15	14	2	21	6	2	15	15	0	15	14	2	22	7	1	18	12	1	<sup>a</sup> 190	<sup>a</sup> 131	<sup>a</sup> 43
1887	13	13	5	11	20	0	15	12	3	24	6	1	18	9	3	21	7	3	<sup>a</sup> 196	<sup>a</sup> 129	<sup>a</sup> 39
1888	17	13	1	23	8	0	21	7	2	16	10	5	15	8	7	18	6	7	184	118	64
1889	15	16	0	14	16	1	11	18	1	6	20	5	18	8	4	8	11	12	140	181	44
1890	20	11	0	10	20	1	12	12	6	25	2	4	25	4	1	18	12	6	163	155	47
1891	8	23	0	9	22	0	17	13	0	10	20	1	20	10	0	19	9	3	154	172	39
1892	9	22	0	12	19	0	20	10	0	12	13	6	21	4	5	18	8	5	162	146	58
1893	13	18	0	10	21	0	12	17	1	15	12	4	12	15	3	16	10	5	161	160	44
1894	13	16	2	9	22	0	12	18	0	13	16	2	18	12	0	9	8	14	143	177	45
1895	3	28	0	6	25	0	12	17	1	12	13	1	22	5	3	22	7	2	142	172	51
1896	9	19	3	8	21	2	8	22	0	15	14	2	14	12	4	15	12	4	142	187	37
1897	6	25	0	12	19	0	10	20	0	16	11	5	19	10	1	20	9	2	145	185	35
1898	12	19	0	12	19	0	19	10	1	18	13	0	18	10	2	14	13	4	160	172	38
1899	23	3	0	20	10	1	20	8	2	13	15	3	8	19	3	13	13	5	162	167	36
1900	8	23	0	8	22	1	18	9	3	14	12	5	15	9	6	21	9	1	152	170	43
Averages	12	18	1	14	16	1	16	13	1	16	12	3	18	9	3	17	9	5	166	161	48

<sup>a</sup> Record incomplete

## NUMBER OF DAYS WITH FROST.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1877.....							0	0	0	0	0	2
1878.....	4	0	0	0	0	0	0	0	0	0	2	8
1879.....	4	0	0	0	0	0	0	0	0	0	2	5
1880.....	6	7	3	1	0	0	0	0	0	0	1	1
1881.....	5	0	2	0	0	0	0	0	0	1	1	0
1882.....	1	3	0	0	0	0	0	0	0	0	1	3
1883.....	7	11	0	1	0	0	0	0	0	0	1	7
1884.....	11	3	4	0	0	0	0	0	0	0	0	8
1885.....	4	0	0	0	0	0	0	0	0	0	2	9
1886.....	7	0	4	0	0	0	0	0	0	7	11	2
1887.....	7	6	0	0	0	0	0	0	0	0	4	12
1888.....	8	0	1	0	0	0	0	0	0	0	3	4
1889.....	13	3	0	0	0	0	0	0	0	0	3	6
1890.....	9	3	0	0	0	0	0	0	0	1	1	3
1891.....	10	2	0	0	0	0	0	0	0	0	0	9
1892.....	3	0	2	2	0	0	0	0	0	0	1	10
1893.....	4	0	3	0	0	0	0	0	0	0	0	3
1894.....	14	9	6	0	0	0	0	0	0	0	8	7
1895.....	10	2	6	0	0	0	0	0	0	0	4	12
1896.....	3	7	4	8	0	0	0	0	0	1	8	5
1897.....	9	6	8	0	0	0	0	0	0	0	8	19
1898.....	13	3	13	1	0	0	0	0	0	0	1	19
1899.....	7	10	0	0	0	0	0	0	0	0	3	13
1900.....	10	9	2	0	0	0	0	0	0	0	0	3

## NUMBER OF DAYS WITH THUNDER STORMS.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1877.....							0	0	0	0	0	0	0
1878.....	0	0	0	0	0	0	0	0	0	0	0	0	0
1879.....	0	0	0	0	0	0	0	0	0	0	0	0	0
1880.....	0	0	0	0	0	0	0	0	0	0	0	0	0
1881.....	0	0	0	0	0	0	0	0	0	0	0	0	0
1882.....	0	0	0	0	0	0	0	0	0	0	0	0	0
1883.....	0	0	0	0	0	0	0	0	0	0	0	0	0
1884.....	0	1	1	1	0	1	0	0	0	1	0	0	5
1885.....	0	0	0	1	0	0	0	0	0	0	0	0	1
1886.....	1	0	1	0	0	0	1	0	0	0	0	0	3
1887.....	0	1	0	0	1	0	0	0	0	0	0	0	2
1888.....	0	0	1	0	0	0	0	1	0	0	0	0	2
1889.....	0	0	3	0	1	0	0	0	0	0	0	0	4
1890.....	0	0	0	0	0	0	0	0	0	0	0	0	0
1891.....	0	0	0	0	0	0	0	0	0	0	0	0	0
1892.....	0	0	0	0	0	0	0	0	0	0	0	0	0
1893.....	0	0	0	0	1	0	0	0	0	0	0	1	2
1894.....	0	0	0	0	0	0	0	1	0	0	0	0	1
1895.....	1	0	0	0	0	0	0	0	0	0	0	0	1
1896.....	0	0	0	1	1	0	0	0	0	0	0	0	2
1897.....	2	0	0	1	0	0	0	1	0	0	0	0	4
1898.....	0	0	0	0	0	0	0	0	0	0	0	0	0
1899.....	1	0	0	0	0	0	0	0	1	0	0	0	2
1900.....	0	0	1	0	0	0	0	0	1	0	1	0	3

## CLIMATOLOGY OF CALIFORNIA.

## NUMBER OF DAYS WITH 0.01 INCH OR MORE RAINFALL

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov.	Dec	Annual
1877	-	-	-	-	-	-	0	0	0	2	1	0	3
1878	7	10	9	7	10	4	0	0	0	3	0	4	54
1879	9	7	6	6	2	2	0	0	0	3	3	10	48
1880	5	8	6	13	1	0	0	0	0	2	3	13	51
1881	3	4	5	4	1	0	0	0	0	3	2	2	24
1882	6	5	10	6	3	0	0	0	0	4	3	2	39
1883	3	4	7	3	0	2	0	0	0	2	0	6	33
1884	5	14	18	9	4	6	0	0	0	1	9	4	26
1885	2	0	1	8	1	0	0	0	0	1	1	3	32
1886	10	2	8	4	0	1	1	1	0	1	1	3	37
1887	2	13	2	5	3	1	2	0	1	1	3	6	48
1888	9	5	11	3	1	0	0	1	1	7	4	20	56
1889	4	5	7	4	3	0	0	1	1	2	2	7	38
1890	9	4	5	2	2	1	0	1	3	2	0	4	27
1891	1	12	4	3	2	0	0	0	1	0	6	6	48
1892	6	11	6	1	5	2	0	1	0	4	3	6	40
1893	7	5	12	1	1	1	0	0	0	4	3	6	40
1894	5	3	3	2	3	0	0	1	2	1	0	10	30
1895	10	5	6	5	4	1	0	0	0	2	5	4	42
1896	9	0	6	4	2	0	1	1	0	3	5	5	36
1897	9	9	7	1	3	0	0	0	0	3	1	2	35
1898	6	4	4	1	2	0	1	0	2	2	0	3	25
1899	4	3	5	2	1	2	0	1	0	4	5	4	31
1900	2	0	2	5	4	0	0	0	0	3	7	0	23
Average	6	6	7	4	3	1	0	0	0	3	3	6	39

## MONTHLY PRECIPITATION (INCHES AND HUNDREDTHS)

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov.	Dec	Annual
1877	-	-	-	-	-	-	0 00	0 00	0 00	0 86	0 45	3 98	5.24
1878	3 33	7 68	2 57	1 71	0 66	0 07	0 00	T	0 00	0 14	T	1 70	20.86
1879	3 59	0 97	0 49	1 19	0 24	0 08	0 00	0 00	0 00	0 98	3 44	6 53	17 41
1880	1 33	1 56	1 45	5 06	0 04	0 00	T	T	0 00	0 14	0 67	8 40	18 65
1881	1 43	0 36	1 66	0 46	0 01	0 00	0 00	T	T	0 82	0 27	0 52	5 53
1882	1 01	2 66	2 66	1 83	0 63	T	0 00	0 00	T	0 05	1 82	0 08	10.74
1883	1 62	3 47	2 87	0 15	2 02	0 03	T	0 00	0 00	1 42	0 00	2 56	14 14
1884	3 15	13 37	12 36	3 54	0 34	1 39	T	T	T	0 30	1 06	1 64	40 15
1885	1 05	T	0 01	2 00	0 06	T	T	T	T	0 26	5 52	1 63	10.53
1886	7 72	1 38	2 50	3 29	0 00	0 01	0 24	0 21	0 00	0 01	1 18	0 18	16 72
1887	0 20	9 25	0 24	2 30	0 20	0 04	0 07	0 00	0 15	0 12	0 78	2 67	16 02
1888	6 03	0 77	3 15	0 11	0 02	T	0 03	0 08	T	0 36	4 01	6 26	21 04
1889	0 25	0 92	6 48	0 27	0 62	0 00	0 00	0 61	0 00	6 95	1 35	15 80	33 25
1890	7 83	1 36	0 66	0 22	0 03	0 02	0 00	0 03	0 06	0 03	0 13	2 32	12.69
1891	0 25	8 56	0 41	0 26	0 31	0 00	T	0 00	0 06	0 00	0 00	1 99	12 84
1892	0 88	3 19	3 39	0 22	2 06	0 06	0 00	0 01	0 00	0 33	4 40	4 18	18 72
1893	6 29	2 27	3 52	0 19	0 06	0 03	0 00	0 00	T	0 75	0 20	3 65	21 96
1894	0 94	0 49	0 37	0 13	0 20	T	T	0 01	0 73	0 02	0 00	4 62	7 61
1895	5 84	0 46	3 77	0 46	0 19	0 01	T	T	T	0 24	0 80	0 78	12.55
1896	3 23	T	2 97	0 19	0 30	T	0 02	0 01	T	1 30	1 66	2 12	11 80
1897	3 70	5 62	2 31	0 02	0 10	T	T	0 00	0 00	2 47	0 01	0 05	14 28
1898	1 26	0 51	0 98	0 03	1 75	T	0 07	T	0 02	0 09	T	0 12	4.83
1899	2 64	0 04	1 31	0 18	0 04	0 53	0 00	0 01	T	1 59	0 90	0 90	8 69
1900	1 17	T	0 99	0 54	1 31	T	T	T	T	0 26	6.53	T	11 30
Average	2 80	2 82	2 72	1 10	0 51	0 10	0 02	0 04	0 04	0 81	1 47	3 28	15 71



## TOTAL PRECIPITATION AT LOS ANGELES, CAL., BY SEASONS:

Season.	Amount.	Season.	Amount.
	<i>Inches.</i>		<i>Inches.</i>
September 1, 1877, to September 1, 1878.....	20.26	September 1, 1889, to September 1, 1890.....	34.25
September 1, 1878, to September 1, 1879.....	11.85	September 1, 1890, to September 1, 1891.....	13.83
September 1, 1879, to September 1, 1880.....	20.34	September 1, 1891, to September 1, 1892.....	11.86
September 1, 1880, to September 1, 1881.....	13.13	September 1, 1892, to September 1, 1893.....	26.27
September 1, 1881, to September 1, 1882.....	10.40	September 1, 1893, to September 1, 1894.....	6.74
September 1, 1882, to September 1, 1883.....	12.11	September 1, 1894, to September 1, 1895.....	16.10
September 1, 1883, to September 1, 1884.....	38.13	September 1, 1895, to September 1, 1896.....	8.54
September 1, 1884, to September 1, 1885.....	9.12	September 1, 1896, to September 1, 1897.....	16.83
September 1, 1885, to September 1, 1886.....	22.76	September 1, 1897, to September 1, 1898.....	7.13
September 1, 1886, to September 1, 1887.....	13.67	September 1, 1898, to September 1, 1899.....	5.53
September 1, 1887, to September 1, 1888.....	13.91	September 1, 1899, to September 1, 1900.....	7.90
September 1, 1888, to September 1, 1889.....	19.78		

## GREATEST PRECIPITATION (INCHES AND HUNDREDTHS) IN 24 HOURS.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1877.....							0.00	0.00	0.00	0.84	0.45	2.21
1878.....	1.16	1.33	0.90	0.47	0.26	0.04	0.00	0.00	0.00	0.13	0.00	3.58
1879.....	1.41	0.63	0.36	0.63	0.20	0.03	0.00	0.00	0.00	0.93	3.41	4.34
1880.....	0.68	0.57	0.75	1.43	0.04	0.00	T.	T.	0.00	0.12	0.56	2.26
1881.....	1.27	0.19	0.76	0.37	0.01	0.00	0.00	T.	T.	0.59	0.21	0.34
1882.....	0.53	1.02	1.24	1.18	0.61	T.	0.00	0.00	T.	0.02	1.77	0.05
1883.....	1.55	2.04	1.67	0.08	1.53	0.02	T.	0.00	0.00	1.37	0.00	1.56
1884.....	1.36	3.63	3.18	2.20	0.22	0.87	0.01	0.01	T.	0.17	1.01	3.04
1885.....	0.89	0.01	0.01	0.83	0.06	T.	T.	T.	0.01	0.26	1.80	1.02
1886.....	3.77	1.32	0.89	1.97	0.01	0.02	0.24	0.21	0.02	0.01	1.18	0.13
1887.....	0.20	3.94	0.23	1.05	0.17	0.04	0.05	T.	0.15	0.12	0.70	1.86
1888.....	3.39	0.30	1.51	0.08	0.02	0.01	0.03	0.08	0.01	0.30	2.02	2.72
1889.....	0.18	0.81	2.53	0.15	0.35	0.01	T.	0.61	0.00	3.62	0.73	4.30
1890.....	4.17	0.70	0.30	0.21	0.02	0.02	0.00	0.03	0.04	0.03	0.13	1.20
1891.....	0.25	2.75	0.22	0.85	0.30	0.00	T.	0.00	0.06	0.00	0.00	1.04
1892.....	0.49	1.43	1.96	0.22	1.76	0.05	0.00	0.01	0.00	0.30	3.75	2.35
1893.....	3.29	1.33	2.51	0.19	0.06	0.03	0.00	0.00	T.	0.39	0.14	1.82
1894.....	0.88	0.24	0.35	0.07	0.09	T.	T.	0.01	0.71	0.02	0.00	1.33
1895.....	1.81	0.26	2.25	0.29	0.13	0.01	T.	T.	T.	0.20	0.40	0.45
1896.....	1.73	T.	1.33	0.07	0.29	T.	0.02	0.01	T.	1.29	1.14	1.22
1897.....	1.57	2.13	0.81	0.02	0.06	T.	T.	0.00	0.00	1.75	0.01	0.03
1898.....	0.41	0.28	0.50	0.03	1.46	T.	0.07	T.	0.01	0.03	T.	0.11
1899.....	1.70	0.02	0.84	0.10	0.04	0.57	0.00	0.01	T.	1.09	0.53	0.84
1900.....	1.16	T.	0.90	0.38	1.32	T.	T.	T.	T.	0.25	3.79	T.

## CLIMATOLOGY OF CALIFORNIA.

## PREVAILING WIND DIRECTION

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual.
1877							W	W	W	W	N	N	W
1878	N	NE	N	SW	SW	SW	W	W	W	W	N	NE	W
1879	NE	NE	SW	SW	SW	W	W	W	W	NE	NE	NE	NE
1880	N	NE	NE	SW	SW	SW	SW	SW	SW	SW	NE	NE	SW
1881	NE	NE	NE	W	W	W	W	W	W	W	SW	W	W
1882	NE	NE	W	W	W	W	W	W	W	W	NE	NE	W
1883	NE	NE	W	W	W	W	W	W	W	W	NE	NE	W
1884	NE	NE	NE	W	W	W	W	W	W	W	W	NE	W
1885	NE	NE	W	W	W	W	W	W	W	W	W	NE	W
1886	E	NE	W	W	W	W	W	W	W	W	NE	NE	W
1887	NE	SE	W	W	W	W	W	W	W	W	W	NE	W
1888	E	W	W	W	W	W	W	W	W	W	NE	W	W
1889	W	W	W	W	W	W	W	W	W	W	N	NE	W
1890	NE	N	W	W	W	W	W	W	W	W	W	N	W
1891	W	W	W	W	W	W	W	W	W	W	W	N	W
1892	NE	W	W	W	W	W	W	W	W	W	W	W	W
1893	NW	NE	NE	W	W	W	W	W	W	W	W	NE	W
1894	W	W	W	W	W	W	W	W	W	W	W	E	W
1895	E	NE	W	W	W	W	W	W	W	W	NE	NW	W
1896	W	NE	W	W	W	W	W	W	W	W	W	NE	W
1897	NE	W	SW	W	W	SW	W	W	W	W	W	W	W
1898	NE	W	W	W	W	W	W	SW	W	W	W	W	W
1899	W	W	W	W	SW	SW	W	W	W	W	W	N	W
1900	W	W	W	W	W	W	W	SW	W	W	W	NE	W
Average	NE	NE	W	W	W	W	W	W	W	W	W	NE	W

## HIGHEST VELOCITY OF WIND (MILES PER HOUR) AND DIRECTION.

Year	Jan	Feb	Mar	Apr	May	June	July	Aug.	Sept.	Oct	Nov.	Dec
1877							13 SW	16 W	12 W	24 N.	24 N.	24 NE
1878	26 NW	25 W	20 NE	25 SW	16 SW	15 SW	15 W.	15 W	16 W	14 W.	21 NW.	23 E.
1879	29 E	17 W	22 W	23 W	21 W	17 W.	14 W.	14 W.	15 W.	23 W.	24 NW.	27 E.
1880	21 NE	26 NW	17 N	23 SW	19 SW	14 SW	22 S	19 SW	14 W.	16 SW	17 NW.	22 NW
1881	17 SW	33 NW	46 SW	24 S	19 SW	20 W	19 SW	21 W	24 W	24 NW	43 NE	26 S.
1882	48 NE	30 NW	30 E	30 N	26 W	18 W	18 W	17 W	28 W.	28 NW.	20 E.	28 N.
1883	34 E	28 NW	22 W	42 W	24 E	21 W	16 W.	17 W	20 W.	26 W	16 W.	28 NW.
1884	24 SW	40 W	30 NW	24 W	18 W	20 W	18 W	20 W	18 W.	24 NW.	14 NW.	34 NE.
1885	20 NW	26 NW	20 W	28 W	23 W	21 NW.	20 W	22 W	18 W	17 W	26 E.	36 N.
1886	37 W	29 W	25 W	28 SE	20 W	17 W	22 N	18 W	16 W.	24 W.	30 W.	20 NW.
1887	24 NW	32 NW.	18 W	37 W	30 NW	20 W.	20 W	18 W	23 W.	34 NE	18 W.	37 E.
1888	33 N	23 NE	30 E	28 W	24 W	19 W	21 W	18 W	23 W	18 SW.	18 NE	26 E.
1889	17 N	24 W	24 E	24 NW	23 W	14 SW	14 W.	13 W	15 W	20 E	22 N	20 E.
1890	17 E	18 W	24 NW	19 NW	15 W	18 W	13 W	14 W	15 S	15 W	14 W	18 W.
1891	19 NW	24 E	24 W	16 E	18 W	16 W.	15 W	13 W	20 NW	16 W	12 W.	28 N
1892	17 E	17 E	21 W	23 W.	20 W	24 W	13 W	13 SW	14 W	16 SW.	21 N	24 NE.
1893	23 E	28 N	24 E	28 N	14 W	14 W	14 W	16 W	13 W	17 E.	18 E	25 E.
1894	14 W	25 NW	30 N	24 NW	18 W	18 W.	15 W	17 SE	18 W.	13 W	12 W.	23 W
1895	18 SW	19 NW	20 NW	26 NW	26 W	15 W	14 W	12 W	14 NW	14 W.	12 E.	18 E
1896	20 NW	22 NW	21 NW	24 W	15 W	13 SW	15 W	15 W.	15 W	24 W	20 NW	16 E
1897	34 E	24 SW	22 NW	24 W	20 N	20 SW	15 W	15 W	15 S	20 NW	16 W	24 NW
1898	24 E	17 W	24 NW	20 W	15 W	15 W	15 W.	13 SW	17 W	20 W	24 NE	22 NW.
1899	30 E	20 SW	24 SW	20 SW	23 NW	15 SW	16 W	13 W.	12 W.	20 SW.	16 NW.	16 NW
1900	23 NW	18 N	14 W	22 W	22 W	14 SW	17 W	15 W.	18 S	21 W	20 SE.	14 NW.

## AVERAGE DAILY WIND MOVEMENT (MILES PER HOUR).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1877.....							104	94	108	111	112	120
1878.....	126	141	119	114	112	105	106	98	101	92	110	126
1879.....	133	193	104	127	135	119	106	99	92	114	102	109
1880.....	104	128	117	136	118	106	109	102	90	78	64	78
1881.....	105	159	136	126	140	141	137	128	131	124	175	132
1882.....	152	139	143	98	125	138	134	131	130	138	131	141
1883.....	178	161	124	171	157	130	131	127	126	147	133	142
1884.....	167	189	183	150	130	128	102	119	119	120	110	140
1885.....	136	135	115	144	103	125	102	100	85	81	157	159
1886.....	169	143	147	151	128	126	130	121	112	132	149	118
1887.....	142	189	123	136	122	148	128	130	125	136	122	154
1888.....	142	121	149	138	138	136	133	124	117	110	71	87
1889.....	76	86	96	88	100	88	83	82	87	93	87	96
1890.....	95	85	100	83	86	91	81	84	77	75	90	88
1891.....	97	117	98	91	94	91	84	83	84	67	66	113
1892.....	77	78	92	98	95	93	82	79	73	74	75	89
1893.....	77	95	102	101	98	88	90	87	90	84	79	86
1894.....	81	100	101	101	99	105	85	88	83	68	49	86
1895.....	92	81	86	91	95	89	77	68	79	74	73	82
1896.....	84	87	90	111	98	83	88	85	97	88	94	87
1897.....	110	125	128	110	101	112	106	103	101	94	88	94
1898.....	117	92	121	113	111	104	107	100	91	80	81	97
1899.....	85	107	121	113	110	107	102	100	84	106	86	81
1900.....	76	92	90	120	116	113	120	113	111	98	99	88
Average.....	114	124	116	118	115	111	106	102	100	99	100	108

## AVERAGE HOURLY WIND VELOCITY (MILES PER HOUR).

1885.....	5.7	5.6	4.8	6.0	4.3	5.2	4.2	4.1	3.6	3.4	6.5	6.6
1886.....	7.0	6.0	6.1	6.3	5.8	5.3	5.4	5.1	4.7	5.5	6.2	4.9
1887.....	5.9	7.9	5.1	5.6	6.3	6.2	5.3	5.4	5.2	5.7	5.1	6.4
1888.....	5.9	5.0	6.2	5.8	5.7	5.7	5.6	5.2	4.9	4.6	2.9	3.6
1889.....	3.2	3.6	4.0	3.6	4.1	3.7	3.4	3.4	3.6	3.9	3.6	4.0
1890.....	4.0	3.5	4.2	3.4	3.6	3.8	3.4	3.5	3.2	3.1	3.7	3.7
1891.....	4.1	4.9	4.1	3.8	3.9	3.8	3.5	3.5	3.5	2.8	2.8	4.7
1892.....	3.2	3.2	3.8	4.1	3.9	3.9	3.4	3.3	3.0	3.1	3.1	3.7
1893.....	3.2	4.0	4.2	4.2	4.1	3.7	3.7	3.6	3.7	3.5	3.3	3.6
1894.....	3.4	4.2	4.2	4.2	4.1	4.4	3.5	3.6	3.5	2.8	2.1	3.6
1895.....	3.9	3.4	3.6	3.8	4.0	3.7	3.2	2.8	3.3	3.1	3.1	3.4
1896.....	3.5	3.6	3.8	4.6	4.1	3.4	3.6	3.6	4.0	3.7	3.9	3.6
1897.....	4.6	5.2	5.3	4.6	4.2	4.7	4.4	4.3	4.2	3.9	3.7	3.9
1898.....	4.9	3.9	5.1	4.7	4.6	4.3	4.5	4.2	3.8	3.3	3.8	4.0
1899.....	3.6	4.5	5.1	4.7	4.6	4.5	4.3	4.2	3.5	4.4	3.6	3.4
1900.....	3.2	3.8	3.8	5.0	4.8	4.7	5.0	4.7	4.6	4.1	4.1	3.7
Average.....	4.3	4.5	4.6	4.6	4.5	4.4	4.1	4.0	3.9	3.8	3.8	4.2

# CLIMATOLOGY OF CALIFORNIA.

## MONTHLY, SEASONAL, AND ANNUAL SUMMARIES

	Temperature									Precipitation						
	Mean					Absolute maximum	Year	Absolute minimum	Year	Mean monthly	Greatest monthly	Year	Least monthly	Year	Greatest in any consecutive 24 hours	Year
	Monthly	Warmest month	Year	Coldest month	Year											
January . . . . .	54	58	1900	49	1890	87	1896	30	1883	2 80	7 83	1890	0 20	1887	4 17	1890
February . . . . .	55	60	1886	51	1880	88	1896	28	1883	2 82	13 37	1884	T	1896	3 94	1887
March . . . . .	57	62	1885	52	1880	99	1879	31	1893	2 72	12 36	1884	0 01	1885	3 18	1884
April . . . . .	60	63	1885	56	1896	99	1898	38	1896	1 10	5 06	1880	0 02	1897	2 20	1884
May . . . . .	63	66	1885	60	1899	103	1896	40	1883	0 51	2 06	1892	0 00	1886	1 76	1892
June . . . . .	67	71	1883	63	1894	105	1890	46	1894	0 10	1 39	1884	0 00		0 87	1884
July . . . . .	71	74	1891	65	1880	109	1891	49	1888	0 02	0 24	1886	0 00		0 24	1886
August . . . . .	72	75	1885	68	1900	106	1885	50	1883	0 04	0 61	1889	0 00		0 61	1889
September . . . . .	70	74	1888	66	1880	108	1885	44	1880	0 04	0 73	1894	0 00		0 71	1894
October . . . . .	64	68	1890	60	1886	102	1885	40	1892	0 81	6 95	1889	0 00		3 62	1889
November . . . . .	60	66	1900	56	1880	96	1890	34	1886	1 47	6 53	1900	0 00		3 79	1900
December . . . . .	56	61	1890	53	1891	89	1897	30	1897	3 28	15 80	1889	0 05	1897	4 34	1879
Annual . . . . .	62									15 71						
Winter . . . . .	54															
Spring . . . . .	60															
Summer . . . . .	70															
Fall . . . . .	65															

	Mean number of days—					Winds						
	Clear	Partly cloudy	Cloudy	0 01 inch or more rain	Prevaling direction	Highest velocity	Direction	Year	Daily movement, miles p h	Hourly movement	Average relative humidity	
January . . . . .	16	9	6	6	N E	48	N E	1882	114	4 3		
February . . . . .	13	9	6	6	N E	40	W	1884	124	4 5		
March . . . . .	12	12	7	7	W	46	S W	1881	116	4 6		
April . . . . .	12	12	6	4	W	42	W	1883	118	4 6		
May . . . . .	10	15	6	3	W	30	N W	1887	115	4 5		
June . . . . .	10	17	3	1	W	24	W	1892	111	4 4		
July . . . . .	12	18	1	0	W	22	N	1886	106	4 1		
August . . . . .	14	16	1	0	W	22	W	1895	102	4 0		
September . . . . .	16	13	1	0	W	28	W	1882	100	3 9		
October . . . . .	16	12	3	3	W	34	W	1887	99	3 8		
November . . . . .	18	9	3	3	W	43	N E	1881	100	3 8		
December . . . . .	17	9	5	6	N E	37	E	1887	108	4 2		
Year . . . . .	166	151	48	39	W						71	
Winter . . . . .	46	27	17	18	N E						67	
Spring . . . . .	34	39	19	14	W						73	
Summer . . . . .	36	51	5	1	W						74	
Fall . . . . .	50	34	7	6	W						69	

## SAN DIEGO, CAL.

By Mr. FORD A. CARPENTER, Observer, Weather Bureau.

Four elements enter into a consideration of the climate of San Diego. Named according to their importance, they are as follows: (1) Distance from the northern storm tracks, and the southern storms of the lower California coast; (2) proximity to the ocean on the west; (3) the mountains in the east; and (4) the great Colorado Desert still farther east. The number of the northern areas of low pressure sufficiently great and moving far enough south to exert an influence at the latitude of San Diego are comparatively few; not one-tenth of these "lows" have an appreciable effect on the climate. The storms from the south ("Sonoras," as they are locally known) have but little energy, and probably average two a year. As is the case in all marine climates, the ocean exerts by far the most powerful effect. This is noticed in the slight daily variation in temperature and the absence of either cold or hot weather. The average daily change in temperature from day to day is 2 degrees, and the extremes in temperature from a record of thirty years are 101° and 32°. The temperature has exceeded 90° nineteen times in thirty years, or on an average of about twice every three years. Four times in the history of the station has the temperature touched 32°, but has never fallen lower. Four killing frosts have occurred in San Diego since the establishment of the station, but aside from blackening tender shoots and killing delicate flowers, no damage was done.

The desert winds are responsible for temperatures above 90°, and they are therefore accompanied by extremely low humidity. Records of humidity below 10 per cent are not uncommon during the two or three hours' duration of the desert wind. Three per cent is the lowest relative humidity ever recorded at this station. As the sea breeze is stronger than the desert wind, the highest point reached, whenever the temperature is above 90°, usually occurs about 11 a. m. At this time the sea breeze overcomes the land breeze and the temperature drops to the normal.

Nothing so clearly illustrates the strictly local character of the climate of San Diego as the humidity. While the mean annual relative humidity is 78 per cent at the Weather Bureau station, 2 miles north and at an increase of 200 feet in elevation, the humidity decreases 15 per cent. Five miles away, and at an elevation of 300 feet, there is a further decrease of 5 per cent. The temperature is of course proportionately higher.

The maximum amount of sunshine occurs in November and the minimum in May and June, the winters being usually bright and warm and the summers cloudy and cool. The photographic sunshine recorder was installed in 1890, and this ten years' record shows an average of four days each year without sunshine.

There is a difference of about 1 mile an hour in the average hourly velocity of the wind between the summer and the winter months; the mean annual hourly velocity is 5 miles. While the wind blows from every point of the compass during a normal day, the land breeze is very light, averaging about 3 miles per hour, reaching its lowest velocity just before the sea breeze starts in. The records show that there is an average velocity of from 6 to 9 miles from 10 a. m. to 6 p. m. During the summer a velocity of 6 miles is attained at 9 a. m., increasing to 10 miles at 2 p. m., reaching 6 miles at 7 p. m. The winter months have about five hours of wind over 6 miles, beginning shortly after noon. Winds from 25 to 30 miles per hour occur infrequently, the average annual number being two. Winds of from 31 to 40 miles have an average of less than one a year. The highest velocity ever attained was 40 miles from the northwest, in February, 1878.

The record of meteorological observations began in July, 1849, and was made entirely by officials of the Government. The Army and Coast Survey kept up the record until the establishment of this station by the Signal Service, November 1, 1871. Since this date the location of the observing office has been changed a number of times, but the different places have all been within a radius of a few blocks. The office is now in the Keating building, corner Fifth and F streets. The instruments have elevations as follows: Thermometer, 94 feet; rain gauge, 86 feet; anemometer, 102 feet.

## CLIMATOLOGY OF CALIFORNIA.

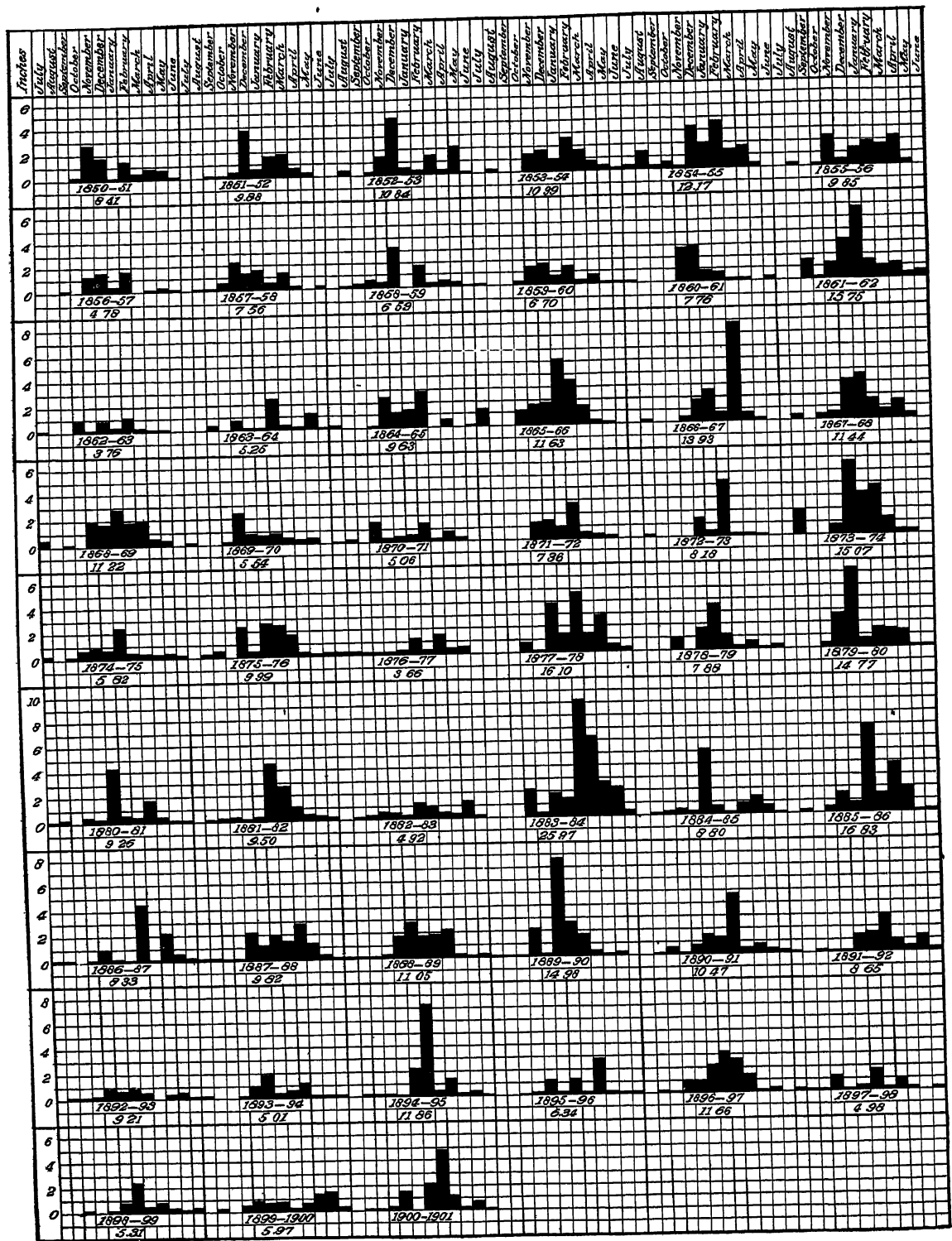
## MEAN MONTHLY AND ANNUAL TEMPERATURE (DEGREES FAHRENHEIT)

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1852	53 1	55 9	55 0	57 6	61 2	67 1	73 2	72 5	73 6	65 0	57 3	51 9	62 0
1853	53 8	53 0	57 7	62 6	63 3	68 4	72 8	72 9	70 7	68 8	60 4	56 2	63 4
1854	54 2	55 0	56 4	63 3	60 7	64 1	73 1	72 1	66 7	64 0	58 7	55 5	62 0
1855	52 6	56 2	58 4	62 3	64 0	68 8	70 9	72 0	68 3	66 6	56 4	52 4	62 1
1856	51 0	53 5	56 2	60 0	61 0	68 6	72 3	72 5	68 8	61 6	56 2	50 0	61 0
1857	52 4	53 6	58 8	62 6	64 4	69 1	67 3	72 8	68 4	63 9	57 2	51 8	61 9
1858	51 2	56 0	55 1	57 8	62 8	66 5	69 2	69 8	69 6	63 5	58 6	53 1	61 1
1859	54 5	54 8	55 3	56 2	60 1	67 0	69 7	68 4	66 6	65 1	60 1	55 3	61 1
1860	51 4	53 9	59 0	60 4	61 9	64 5	68 8	70 8	69 1	63 6	56 9	55 2	61 3
1861	51 4	56 5	57 7	63 8	65 7	67 6	73 1	72 3	69 3	64 6	59 8	58 1	63 3
1862	55 6	51 8	66 8	59 4	62 7	68 2	71 2	72 9	69 4	65 8	60 4	55 1	62 5
1863	52 8	52 8	59 9	61 0	62 6	64 6	68 0	68 1	68 9	65 7	59 0	55 8	61 6
1864	56 0	56 2	58 5	61 8	65 2	69 0	69 7	75 1	69 2	64 6	59 1	56 5	63 4
1865	55 6	54 7	57 8	59 8	64 3	65 7	67 7	71 8	68 2	65 2	62 1	52 2	62 1
1866	54 5	57 0	57 9	62 7	60 5	66 6	69 7	73 1	69 6	65 0	60 1	58 6	63 0
1867	55 2	53 2	55 4	61 7	63 6	69 1	70 5	74 5	71 7	61 0	63 2	63 3	63 8
1868	54 5	56 5	57 4	61 3	62 3	65 7	69 4	74 1	72 2	66 1	62 1	55 4	63 1
1869	56 6	55 6	59 8	62 1	62 2	64 4	68 8	70 3	68 3	66 3	61 1	50 6	62 2
1870	55 6	57 5	56 3	58 8	61 4	64 6	68 3	70 5	66 9	63 6	59 1	51 1	61 2
1871	58 5	52 2	56 7	57 7	63 6	65 1	71 1	72 1	68 3	65 6	58 3	56 8	61 8
1872	52 7	55 2	56 4	56 0	60 4	64 9	66 6	68 9	66 0	62 5	59 1	55 4	60 4
1873	56 7	53 3	56 7	58 0	60 0	62 7	67 0	69 0	67 7	62 0	60 3	54 3	60 0
1874	54 7	52 6	52 6	56 2	60 5	63 2	68 3	68 1	65 7	63 2	56 7	53 3	59 6
1875	53 4	54 6	55 0	57 8	62 6	64 6	68 3	71 2	67 7	67 2	60 3	56 9	61 6
1876	51 9	55 9	54 9	59 0	60 9	65 2	68 3	68 8	66 3	64 6	59 4	56 8	61 0
1877	57 4	57 9	58 9	58 3	60 3	66 3	68 4	68 4	68 0	63 9	60 6	56 8	62 1
1878	55 6	56 0	56 7	58 1	61 5	64 1	66 8	68 3	67 3	62 0	57 5	53 5	60 6
1879	52 3	54 8	57 9	53 1	60 1	64 1	65 7	68 6	66 6	62 6	56 2	53 9	60 1
1880	52 5	50 8	52 1	56 5	60 6	63 0	63 4	65 8	63 1	61 2	56 2	56 9	58 5
1881	52 8	55 7	54 3	60 8	62 3	64 1	67 2	68 2	66 7	61 5	56 8	55 0	60 4
1882	50 4	51 2	55 1	56 6	61 9	64 3	66 7	70 2	66 8	62 0	57 0	55 7	59 8
1883	53 4	53 9	57 4	57 4	60 6	66 6	68 7	68 9	69 7	61 7	58 7	57 5	61 2
1884	55 0	55 9	56 5	57 6	61 4	64 4	68 4	69 5	65 1	61 3	58 6	51 4	60 7
1885	54 0	55 4	59 6	62 0	63 3	64 3	67 6	71 8	68 0	63 9	59 6	57 1	62 0
1886	55 9	58 5	55 0	57 2	60 4	63 1	67 1	70 5	66 6	59 7	56 0	56 0	60 5
1887	54 3	52 9	57 2	59 0	62 1	64 6	66 5	66 2	65 7	61 5	59 2	51 6	60 6
1888	51 6	54 9	55 8	60 8	61 2	66 0	68 4	69 2	69 7	65 0	59 9	58 2	61 7
1889	54 8	58 0	59 2	60 4	60 8	64 0	67 6	70 8	70 2	65 4	62 0	57 1	62 6
1890	51 0	54 3	56 4	58 6	60 4	64 1	68 5	69 8	69 1	64 6	63 8	60 8	61 8
1891	54 6	53 3	56 9	58 2	60 8	65 0	69 0	72 4	70 2	63 8	59 2	61 5	62 0
1892	55 1	55 0	56 0	57 8	61 0	62 0	64 9	67 8	65 4	62 7	60 9	54 2	60 2
1893	57 4	54 4	54 2	57 5	61 0	63 4	67 4	70 0	64 6	62 7	57 6	57 4	60 6
1894	49 5	50 5	52 6	56 4	58 6	61 4	64 8	67 0	65 9	62 8	57 1	54 8	58 1
1895	53 2	55 8	55 4	57 8	61 9	65 0	65 6	61 7	67 4	64 4	59 4	55 0	60 5
1896	55 5	57 7	58 2	56 5	62 0	64 8	68 6	69 4	66 7	64 2	59 7	59 0	61 9
1897	55 8	54 7	54 2	59 8	60 9	63 4	67 0	69 9	68 1	62 4	60 2	55 0	61 0
1898	50 8	55 2	54 5	59 1	58 8	63 8	66 7	70 6	68 5	62 3	59 4	56 6	60 5
1899	55 5	53 4	56 4	58 2	57 7	61 4	65 6	65 8	65 5	62 7	60 8	58 7	60 1
1900	57 8	57 6	59 2	56 8	60 9	64 4	67 6	66 2	65 6	63 1	64 6	60 4	62 0
1901	56 2	57 5	60 0	57 4	60 0	62 5	65 8	68 2	64 8	-	-	-	-
Mean (50 years)	53 9	54 8	56 5	59 1	61 6	65 1	67 2	70 0	68 0	63 9	59 2	55 6	61 4

## MAXIMUM AND MINIMUM TEMPERATURES.

	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
1872.....	73	37	68	44	71	44	74	43	83	52	80	55
1873.....	75	44	77	37	72	40	82	42	78	52	75	58
1874.....	71	42	64	41	68	41	71	43	74	50	76	52
1875.....	68	42	70	44	71	39	77	39	82	50	77	53
1876.....	65	39	77	39	75	43	87	43	76	50	88	51
1877.....	78	42	75	45	70	48	67	44	68	51	94	55
1878.....	68	38	69	44	68	42	77	44	73	48	76	51
1879.....	76	35	74	38	99	44	82	45	94	47	93	52
1880.....	73	32	63	35	69	38	80	42	84	46	73	52
1881.....	70	36	82	39	72	40	82	51	72	51	76	53
1882.....	64	34	70	37	79	39	70	43	73	48	75	55
1883.....	76	32	83	36	71	48	85	42	89	45	84	56
1884.....	78	39	79	38	68	43	69	45	72	47	81	50
1885.....	68	38	76	40	81	42	83	47	73	52	74	52
1886.....	74	35	80	44	68	41	71	45	72	50	75	54
1887.....	74	38	76	38	82	44	80	44	79	48	78	54
1888.....	64	33	67	42	72	41	93	47	70	52	76	54
1889.....	78	36	85	37	80	45	83	47	80	50	72	56
1890.....	66	35	77	38	74	41	85	45	75	46	93	51
1891.....	76	35	70	34	76	41	77	44	67	53	78	53
1892.....	75	38	68	42	73	44	80	41	87	47	75	51
1893.....	80	38	75	40	75	40	78	43	88	49	75	53
1894.....	69	32	69	34	72	36	83	43	72	45	73	50
1895.....	77	36	82	39	74	38	81	44	80	51	77	51
1896.....	77	39	83	39	85	41	74	42	98	48	89	54
1897.....	73	40	76	38	70	40	88	46	67	50	70	54
1898.....	78	36	75	42	77	38	86	45	69	51	88	54
1899.....	74	43	76	34	86	44	93	46	66	48	70	55
1900.....	79	46	76	45	80	46	67	45	75	49	87	56
1901.....	75	40	83	44	82	47	66	46	67	51	86	53

[From 1875 to 1900, 9,496 days, there were 9,181 days of temperature not above 80° nor below 40°.]





## CLIMATE OF SOUTHERN COAST.

85

## MEAN MONTHLY RELATIVE HUMIDITY (PER CENT).

[Record began January 1, 1871.]

Month.	A. M.	P. M.	Average.	Month.	A. M.	P. M.	Average.	Month.	A. M.	P. M.	Average.
January .....	74.9	74.0	74.4	May.....	82.5	74.8	78.6	September .....	84.7	78.0	81.5
February .....	77.6	78.5	75.6	June.....	83.8	75.2	79.5	October.....	81.8	76.2	78.8
March .....	81.2	78.9	77.6	July .....	85.9	76.4	81.2	November .....	72.4	72.8	72.6
April.....	82.2	78.4	77.8	August.....	85.4	76.4	80.9	December.....	73.2	72.9	73.0

## NUMBER OF HIGH WINDS IN TWENTY-EIGHT YEARS.

[Record began January 1, 1873.]

Month.	Velocity.		Month.	Velocity.		Month.	Velocity.	
	25 to 30 miles.	21 to 40 miles.		25 to 30 miles.	21 to 40 miles.		25 to 30 miles.	21 to 40 miles.
January .....	8	11	June.....	0	1	November.....	5	8
February.....	8	9	July .....	3	0	December.....	10	5
March .....	9	8	August.....	1	2	Annual average.....	2	2
April .....	8	5	September.....	1	1			
May .....	2	2	October.....	3	1			

## SUMMARY OF MONTHLY MEANS AND EXTREMES OF TEMPERATURE.

Month.	Highest monthly mean.		Lowest monthly mean.		Absolute maximum.		Absolute minimum.		Greatest daily range.	Mean daily range.	Mean variability.	Mean of threeconsecutive warmest days.	Mean of threeconsecutive coldest days.
	Temperature.	Date.	Temperature.	Date.	Temperature.	Date.	Temperature.	Date.					
January.....	57.8	1900	49.5	1894	80.0	2, 1893	32.0	a 31, 1880	35.0	16.9	2.4	65.7	40.2
February .....	58.5	1886	50.5	1894	85.0	12, 1889	34.0	10-11, 1894	37.0	13.7	2.1	69.2	41.9
March .....	59.9	1863	52.1	1880	99.0	29, 1879	38.0	6, 1880	43.0	14.2	2.3	71.3	44.3
April.....	63.8	1861	51.7	1901	98.0	12, 1888	39.0	14, 1898	40.0	14.2	2.2	74.3	50.5
May.....	65.7	1861	57.7	1899	98.0	25, 1896	39.0	7, 1875	36.0	12.2	1.6	72.1	52.6
June .....	69.1	1857	61.4	1894	94.0	10, 1877	50.0	14, 1884	35.0	12.1	1.9	75.8	55.4
July.....	73.2	1852	63.4	1880	88.0	25, 1891	54.0	13, 1894	24.0	11.6	1.7	78.0	59.5
August.....	75.1	1864	65.8	1880	92.0	15, 1884	54.0	16, 1894	24.0	11.6	1.7	78.0	59.5
September .....	73.6	1852	63.1	1880	101.0	22, 1883	50.0	29, 1879	28.0	11.4	1.7	81.1	60.8
October .....	68.8	1853	59.7	1886	92.0	26-28, 1879	44.0	18, 1882	35.0	13.0	2.0	82.9	57.0
November .....	64.6	1900	56.0	1886	91.0	4, 1890	38.0	30, 1878	37.0	14.1	1.8	79.0	49.8
December.....	63.3	1867	50.0	1856	82.0	6, 1874	32.0	8, 1881	38.0	17.7	2.3	75.6	44.9
Annual .....	63.8	1867	58.4	1894	101.0	Sept. 22, 1883	32.0	24, 1895	40.0	16.2	1.9	75.6	42.8
								25, 1879					

a Also, 21st, 1883; 7th, 1894.

## WEATHER.

Month.	Average number of—				Month.	Average number of—			
	Clear days.	Partly cloudy days.	Cloudy days.	Rainy days.		Clear days.	Partly cloudy days.	Cloudy days.	Rainy days.
January .....	17	8	6	6	August .....	12	15	4	0
February .....	13	9	6	6	September.....	16	11	3	0
March .....	11	10	10	8	October.....	17	10	4	2
April .....	13	10	7	4	November.....	18	8	4	3
May .....	9	11	11	8	December.....	15	10	6	6
June.....	10	14	6	1	Annual.....	165	129	71	41
July .....	15	12	4	0					

## CLIMATOLOGY OF CALIFORNIA.

MONTHLY, SEASONAL, AND ANNUAL PRECIPITATION IN INCHES AND HUNDREDTHS.

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual	Season of—	Seasonal
1850.....	0 00	1 13	1 00	0 09	0 00	0 68	0 00	0 00	0 00	0 19	2 82	1 93	7 84	1849-50	-----
1851.....	0 03	1 51	0 34	0 87	0 71	0 01	0 00	0 00	0 02	0 01	0 25	3 74	7 49	1850-51	8 41
1852.....	0 58	1 84	1 87	0 85	0 32	0 00	0 00	0 40	0 00	0 06	1 45	4 50	11 87	1851-52	9 88
1853.....	0 50	0 20	1 52	0 25	2 10	0 05	0 00	0 21	0 00	0 00	1 28	1 77	7 88	1852-53	10 84
1854.....	0 99	2 56	1 88	0 89	0 18	0 01	0 07	1 36	0 09	0 27	0 04	3 29	11 63	1853-54	10 99
1855.....	1 97	3 59	1 30	1 52	0 06	0 00	0 00	0 04	0 00	0 11	2 15	0 41	11 15	1854-55	12 17
1856.....	1 27	1 86	1 59	2 17	0 29	0 00	0 00	0 00	0 07	0 00	1 22	1 30	9 77	1855-56	9 85
1857.....	0 26	1 76	0 00	0 04	0 08	0 03	0 00	0 02	0 01	0 49	2 16	1 30	6 15	1856-57	4 78
1858.....	1 52	0 44	1 24	0 17	0 00	0 19	0 00	0 04	0 10	0 47	0 28	3 10	7 55	1857-58	7 56
1859.....	0 00	1 89	0 20	0 36	0 17	0 00	0 02	0 00	0 00	0 18	1 49	1 79	6 10	1858-59	6 59
1860.....	0 72	1 49	0 15	0 65	0 04	0 05	0 14	0 00	0 00	0 00	2 88	2 99	9 11	1859-60	6 70
1861.....	0 82	0 79	0 05	0 04	0 00	0 19	0 00	0 00	1 59	0 05	1 19	3 20	7 92	1860-61	7 76
1862.....	5 56	1 39	0 97	1 05	0 16	0 48	0 11	0 00	0 00	0 89	0 05	0 93	11 59	1861-62	15 75
1863.....	0 32	1 09	0 33	0 13	0 02	0 00	0 00	0 00	0 36	0 00	0 73	0 04	3 02	1862-63	3 76
1864.....	0 04	2 50	0 20	0 01	1 25	0 01	0 11	0 00	0 00	0 04	2 41	1 04	7 61	1863-64	5 25
1865.....	1 28	3 00	0 00	0 56	0 00	0 01	1 29	0 00	0 00	0 02	0 52	0 84	7 52	1864-65	9 63
1866.....	5 05	3 43	1 47	0 11	0 09	0 00	0 00	0 10	0 00	0 00	0 24	1 82	12 31	1865-66	11 63
1867.....	2 32	0 85	7 88	0 48	0 04	0 00	0 00	0 30	0 00	0 34	0 45	3 06	15 72	1866-67	13 93
1868.....	3 37	1 63	0 73	1 20	0 15	0 00	0 51	0 00	0 05	0 00	2 00	1 52	11 16	1867-68	11 44
1869.....	2 88	1 88	1 98	0 53	0 33	0 00	0 05	0 00	0 00	0 05	2 32	0 94	10 96	1868-69	11 22
1870.....	0 54	0 77	0 33	0 20	0 28	0 00	0 04	0 07	0 60	1 54	0 18	0 42	4 37	1869-70	5 54
1871.....	0 52	1 35	0 01	0 70	0 84	0 00	0 00	0 00	0 00	0 00	1 33	1 39	5 04	1870-71	5 06
1872.....	0 99	2 63	0 46	0 26	0 12	0 00	0 00	0 18	0 00	0 00	0 00	1 40	6 04	1871-72	7 36
1873.....	0 44	4 15	0 11	0 10	0 08	0 00	0 00	1 95	0 00	0 00	0 77	5 46	13 01	1872-73	8 18
1874.....	3 11	3 73	1 20	0 34	0 34	0 00	0 12	0 00	0 11	0 53	0 88	0 55	10 91	1873-74	15 07
1875.....	2 38	0 37	0 45	0 12	0 20	0 02	0 00	0 21	0 39	0 00	2 25	0 41	6 80	1874-75	5 82
1876.....	2 47	2 44	1 78	0 06	0 05	0 05	0 03	0 06	0 03	0 08	0 04	0 15	7 24	1875-76	9 99
1877.....	1 05	0 18	1 44	0 26	0 43	0 00	0 00	0 00	0 00	0 00	0 06	3 89	8 12	1876-77	8 66
1878.....	1 45	4 83	1 41	2 91	0 58	0 16	0 00	0 00	0 00	0 96	0 00	1 57	13 87	1877-78	16 10
1879.....	3 54	1 04	0 10	0 60	T	0 07	0 00	0 00	0 00	0 29	2 77	6 30	14 71	1878-79	7 88
1880.....	0 61	1 50	1 43	1 34	0 06	0 06	0 09	0 32	0 00	0 53	0 23	4 15	10 37	1879-80	14 77
1881.....	0 52	0 45	1 88	1 35	0 04	0 05	0 00	0 01	0 04	0 24	0 12	0 30	5 00	1880-81	9 26
1882.....	4 53	2 55	1 02	0 45	0 18	0 07	0 00	T	0 01	0 41	0 39	0 13	9 74	1881-82	9 50
1883.....	1 09	0 95	0 41	0 31	1 14	0 08	0 00	0 00	0 00	2 01	0 20	1 82	8 01	1882-83	4 92
1884.....	1 34	9 05	6 23	2 84	2 17	0 31	0 00	T	0 07	0 35	0 11	5 12	27 59	1883-84	25 97
1885.....	0 35	0 02	0 78	1 20	0 61	0 06	T	0 13	T	0 31	1 56	0 71	5 73	1884-85	8 80
1886.....	6 95	1 51	3 73	1 95	0 04	0 07	T	T	0 00	0 05	0 95	0 10	15 35	1885-86	16 83
1887.....	0 04	4 51	0 02	2 14	0 47	0 04	0 01	T	T	T	2 08	1 14	10 45	1886-87	8 33
1888.....	1 96	1 48	2 79	0 10	0 22	0 04	0 01	T	0 04	0 26	1 83	2 84	11 57	1887-88	9 82
1889.....	1 72	1 80	2 20	0 19	0 03	0 10	T	0 04	T	2 12	0 12	7 71	16 03	1888-89	11 05
1890.....	2 79	1 70	0 41	0 05	0 08	0 00	0 00	T	0 65	0 01	0 72	1 61	8 02	1889-90	14 98
1891.....	1 21	4 84	0 27	0 76	0 35	0 05	T	0 00	0 08	0 04	T	1 29	8 99	1890-91	10 47
1892.....	1 58	2 96	0 96	0 41	1 15	0 13	0 00	0 05	T	0 22	0 94	0 69	9 09	1891-92	8 65
1893.....	0 78	0 47	5 50	0 22	0 39	T	T	0 00	0 00	0 11	0 91	1 91	10 29	1892-93	9 21
1894.....	0 29	0 49	1 05	0 11	0 09	0 01	0 00	0 04	0 01	T	0 00	2 26	4 35	1893-94	5 01
1895.....	7 33	0 53	1 43	0 11	0 19	0 00	0 00	0 00	0 01	0 27	1 19	0 27	11 33	1894-95	11 86
1896.....	1 27	0 02	2 89	0 25	0 03	0 01	T	0 13	T	0 97	0 98	2 18	8 73	1895-96	6 34
1897.....	3 13	2 72	1 53	0 02	0 12	T	0 01	T	T	1 06	0 02	0 32	8 93	1896-97	11 66
1898.....	1 71	0 06	0 91	0 22	0 66	0 02	0 00	0 00	0 07	0 00	0 15	0 87	4 67	1897-98	4 98
1899.....	2 34	0 30	0 85	0 29	0 10	0 27	0 00	0 07	0 00	0 35	0 86	0 65	6 08	1898-99	5 31
1900.....	0 60	0 03	0 53	1 26	1 45	0 08	0 00	T	T	0 30	1 43	0 00	5 77	1899-00	5 90
1901.....	2 08	4 77	1 07	0 01	0 77	0 02	T	T	0 06	0 28	0 41	0 02	9 49	1900-01	10 45
Mean.....	1 75	1 91	1 37	0 64	0 34	0 07	0 05	0 11	0 07	0 33	0 96	1 97	9 52	-----	-----

## MONTHLY EXTREMES OF PRECIPITATION.

Month.	Greatest monthly precipitation.		Least monthly precipitation.		Number of times precipitation has exceeded normal in 50 years.	Month.	Greatest monthly precipitation.		Least monthly precipitation.		Number of times precipitation has exceeded normal in 50 years.
	Amount.	Date.	Amount.	Date.			Amount.	Date.	Amount.	Date.	
	Inches.		Inches.				Inches.		Inches.		
January .....	7.83	1895	0.00	a 1850	16	July .....	1.29	1865	0.00	a 1850	8
February .....	9.05	1884	0.02	a 1885	17	August .....	1.95	1873	0.00	a 1850	10
March .....	7.88	1867	0.00	a 1857	20	September .....	1.59	1861	0.00	a 1850	7
April .....	2.91	1878	0.01	a 1864	17	October .....	2.12	1889	0.00	a 1853	15
May .....	2.17	1884	0.00	a 1850	14	November .....	2.88	1860	0.00	a 1872	20
June .....	0.68	1850	0.00	a 1852	10	December .....	7.71	1889	0.00	a 1900	16

a Also in other years.

## GREATEST PRECIPITATION, IN INCHES AND HUNDREDTHS, IN TWENTY-FOUR HOURS.

Year.	Janu-ary.	Febru-ary.	March.	April.	May.	June.	July.	August.	Sep-tember.	Octo-ber.	Novem-ber.	Decem-ber.	Greatest annual.
1872.....	0.53	1.12	0.29	0.15	0.10	0.00	0.00	0.09	0.00	0.00	0.00	0.53	1.12
1873.....	0.20	1.25	0.05	0.10	0.02	0.00	0.00	1.80	0.00	0.00	0.54	2.52	1.80
1874.....	1.35	1.24	0.28	0.33	0.21	0.00	0.09	0.00	0.10	0.18	0.31	0.55	1.35
1875.....	0.95	0.35	0.30	0.11	0.08	0.02	0.00	0.21	0.29	0.00	0.52	0.82	0.95
1876.....	0.55	1.53	0.80	0.05	0.05	0.05	0.03	0.06	0.08	0.06	0.08	0.10	1.53
1877.....	0.41	0.18	0.52	0.16	0.20	0.00	0.00	0.00	0.00	0.78	0.06	1.09	1.09
1878.....	0.55	1.11	0.36	0.82	0.28	0.07	0.00	0.00	0.00	0.96	0.00	0.58	0.96
1879.....	1.63	0.80	0.05	0.17	0.00	0.07	0.00	0.00	0.00	0.16	2.75	2.55	2.75
1880.....	0.31	0.82	0.44	0.38	0.06	0.06	0.07	0.28	0.00	0.48	0.17	1.29	1.29
1881.....	0.29	0.18	0.83	0.70	0.02	0.06	0.00	0.01	0.04	0.21	0.07	0.19	0.83
1882.....	2.94	0.99	0.55	0.13	0.17	0.05	0.00	0.00	0.01	0.21	0.31	0.11	2.94
1883.....	0.98	0.43	0.19	0.18	0.69	0.08	0.00	0.00	0.00	1.82	0.20	0.63	1.82
1884.....	0.92	1.89	1.71	1.01	1.45	0.24	0.00	T.	0.07	0.23	0.10	1.66	1.89
1885.....	0.20	0.01	0.56	0.80	0.54	0.04	T.	0.13	0.00	0.21	0.59	0.48	0.80
1886.....	1.76	0.69	1.38	1.20	0.02	0.04	T.	T.	0.00	0.05	0.74	0.06	1.76
1887.....	0.04	1.96	0.02	0.94	0.44	0.04	0.01	T.	T.	T.	1.80	0.74	1.96
1888.....	0.75	0.66	1.25	0.68	0.15	0.04	0.01	T.	0.04	0.20	0.60	1.04	1.25
1889.....	0.07	0.95	1.16	0.14	0.02	0.10	T.	0.04	T.	1.54	0.08	2.31	2.31
1890.....	1.32	1.04	0.35	0.03	0.04	0.00	0.00	T.	0.37	0.01	0.72	1.23	1.32
1891.....	1.08	1.35	0.17	0.55	0.34	0.05	T.	0.00	0.08	0.02	0.09	0.69	1.35
1892.....	1.25	1.25	0.34	0.41	0.95	0.13	0.00	0.04	T.	0.10	0.82	0.43	1.25
1893.....	0.45	0.43	2.00	0.22	0.22	T.	T.	0.00	0.00	0.11	0.81	0.74	2.00
1894.....	0.20	0.15	0.65	0.06	0.08	0.01	0.00	0.04	0.01	T.	0.00	0.59	0.65
1895.....	2.15	0.29	0.70	0.08	0.15	0.00	0.00	0.00	0.01	0.22	0.46	0.15	2.15
1896.....	0.57	0.02	1.32	0.12	0.03	0.01	T.	0.09	T.	0.64	0.88	1.10	1.32
1897.....	1.62	1.04	0.55	0.02	0.04	T.	0.01	T.	T.	0.67	0.02	0.17	1.62
1898.....	0.55	0.06	0.47	0.09	0.26	0.02	0.00	0.00	0.06	0.00	0.11	0.71	0.71
1899.....	1.33	0.24	0.52	0.28	0.07	0.25	0.00	0.07	0.00	0.20	0.42	0.54	1.33
1900.....	0.66	0.03	0.48	0.79	1.35	0.05	0.00	T.	T.	0.20	0.52	0.50	1.35
1901.....	0.74	2.39	0.53	0.01	0.52	0.02	T.	T.	0.06	0.18	0.37	0.01	2.39
Greatest.....	2.94	2.39	2.00	1.20	1.45	0.25	0.09	1.80	0.37	1.82	2.75	2.55	2.94
Date.....	12	8-9	.....	11-12	14-15	1	22	12	28-29	27	9	27	Jan. 12
Year.....	1882	1901	1893	1886	1884	1899	1874	1873	1890	1883	1879	1879	1882

## TOTAL NUMBER OF DAYS WITH PRECIPITATION SINCE NOVEMBER 1, 1871.

	Janu-ary.	Febru-ary.	March.	April.	May.	June.	July.	August.	Sep-tember.	Octo-ber.	Novem-ber.	Decem-ber.
Less than 0.01 .....	19	22	38	16	43	15	11	17	12	25	15	22
0.01 to 0.10 .....	71	66	82	57	78	31	4	10	14	36	42	62
0.11 to 0.25 .....	31	33	31	35	8	3	0	1	2	23	17	35
0.26 to 0.50 .....	35	30	39	16	8	0	0	2	1	3	15	30
0.51 to 1.00 .....	20	22	21	10	5	0	0	0	0	4	10	20
Over 1.00 inch .....	14	10	5	1	2	0	1	0	0	1	2	13

## CLIMATOLOGY OF CALIFORNIA.

DATES WHEN PRECIPITATION EQUALED OR EXCEEDED 2 50 INCHES IN ANY CONSECUTIVE TWENTY-FOUR HOURS,  
LOCAL TIME

	Inches
December 4, 1873, 10 p m 3d, during night 4th .....	2.52
November 9, 1879, during a m 9th, to 8 10 p m 9th .....	2.75
December 27, 1879, 6 a m to 6 a m December 28 .....	2.55
January 12, 1882, 3 50 a. m to 3 a m. January 13 .....	2.94

No snow is reported to have fallen at San Diego since the beginning of the record of observations in 1850

Maximum rate of rainfall from recording rain gauge; record since 1893: December 28, 1896, in one minute, 0.19; in five minutes, 0.32; in ten minutes, 0.47; in one hour, 0.79.

HIGHEST WIND VELOCITY, DIRECTION, AND DATE FOR EACH MONTH DURING THE PAST TWENTY-SEVEN YEARS.

[Record began January 1, 1873]

Months	Velocity	Direction	Day and year	Months	Velocity	Direction	Day and year
January .....	37	(a)	a1873	July .....	30	NW	2,1881
February .....	40	NW	a1878	August .....	24	W	b18,1885
March .....	37	(a)	a1876	September .....	28	NW	7,1881
April .....	39	(a)	a1877	October .....	32	NW	29,1877
May .....	28	(a)	a1877	November .....	32	NW	c12,1877
June .....	24	SW	11,1886	December .....	36	NW	d2,1887

a Direction and date missing

b Also on August 25, 29, and 31, 1877

c Also on November 21, 1886

d Also, west, on December 28, 1888

## AVERAGE HOURLY WIND VELOCITY (IN MILES PER HOUR)

[Record began January 1, 1873]

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
<b>A M</b>												
1 .....	38	40	37	36	35	31	27	25	26	27	31	36
2 .....	38	41	38	36	34	31	25	23	26	27	32	38
3 .....	38	39	38	36	34	30	24	22	26	29	33	39
4 .....	39	40	38	35	34	31	24	23	27	28	32	39
5 .....	40	41	40	36	34	32	25	23	27	29	34	39
6 .....	41	41	40	36	35	32	26	24	27	29	35	39
7 .....	39	39	40	37	36	32	26	23	28	29	34	39
8 .....	39	41	40	37	34	32	27	24	27	32	35	38
9 .....	39	41	40	37	33	32	28	25	28	31	36	39
10 .....	40	42	38	35	36	34	31	26	28	30	35	40
11 .....	37	40	37	39	43	41	40	34	32	30	31	39
12 (noon) .....	38	38	43	48	56	56	57	50	46	38	31	34
<b>P M</b>												
1 .....	35	47	56	70	78	77	77	71	67	55	44	39
2 .....	45	59	70	87	90	92	91	89	87	74	58	49
3 .....	59	75	85	99	100	100	101	99	100	90	74	64
4 .....	73	88	95	105	105	105	103	103	105	96	87	76
5 .....	80	96	100	106	105	105	104	102	104	98	91	83
6 .....	83	97	99	103	103	101	100	98	99	94	87	80
7 .....	81	92	94	96	96	94	93	92	90	84	76	70
8 .....	67	80	85	87	88	86	84	83	80	68	57	55
9 .....	49	61	69	74	75	74	75	83	63	48	39	43
10 .....	40	46	51	57	61	60	61	71	48	35	32	38
11 .....	38	40	41	45	49	49	47	54	36	30	31	38
12 (midnight) .....	38	40	38	38	40	38	36	41	30	26	31	38
Average .....	48	54	56	59	60	58	56	54	52	48	46	47

## NUMBER OF DAYS WITH ONE HOUR OR MORE OF FOG, AND NUMBER OF THUNDERSTORMS IN ELEVEN YEARS.

[Record began January 1, 1890.]

Month.	Foggy days.		Thunderstorms.		Month.	Foggy days.		Thunderstorms.	
	Num-ber.	Aver-age.	Num-ber.	Aver-age.		Num-ber.	Aver-age.	Num-ber.	Aver-age.
January .....	22	2	0	0	July .....	6	0	2	0
February .....	17	1	3	0	August .....	6	0	3	0
March .....	10	1	2	0	September .....	24	3	0	0
April .....	16	2	3	0	October .....	26	3	6	1
May .....	3	0	1	0	November .....	22	2	1	0
June .....	6	1	0	0	December .....	11	1	1	0

## AVERAGE PRESSURE, IN INCHES AND THOUSANDTHS, FOR EACH HOUR OF SEVENTY-FIFTH MERIDIAN TIME.

[Correction applied to reduce to standard gravity,  $-0.03$ .  $\lambda=82^{\circ} 48' N$ ;  $\phi=117^{\circ} 10' W$ ; local time  $2^h 49^m$  slow.  $H=87$  ft.]

1900.	1 <sup>h</sup> a.m.	2 <sup>h</sup>	3 <sup>h</sup>	4 <sup>h</sup>	5 <sup>h</sup>	6 <sup>h</sup>	7 <sup>h</sup>	8 <sup>h</sup>	9 <sup>h</sup>	10 <sup>h</sup>	11 <sup>h</sup>	Noon.	1 <sup>h</sup> p.m.
January .....	29.981	0.981	0.974	0.971	0.971	0.970	0.964	0.958	0.957	0.976	0.991	0.005	0.013
February .....	29.918	0.920	0.917	0.913	0.910	0.907	0.903	0.905	0.914	0.921	0.930	0.937	0.940
March .....	29.862	0.861	0.859	0.857	0.850	0.848	0.840	0.842	0.849	0.856	0.868	0.875	0.878
April .....	29.881	0.881	0.879	0.874	0.865	0.861	0.859	0.861	0.871	0.882	0.892	0.897	0.900
May .....	29.885	0.885	0.882	0.876	0.869	0.864	0.865	0.865	0.874	0.884	0.888	0.891	0.891
June .....	29.817	0.816	0.807	0.799	0.792	0.790	0.788	0.797	0.804	0.813	0.821	0.823	0.825
July .....	29.762	0.763	0.761	0.758	0.752	0.751	0.753	0.759	0.771	0.780	0.785	0.782	0.783
August .....	29.632	0.632	0.630	0.627	0.619	0.615	0.616	0.623	0.634	0.644	0.653	0.661	0.659
September .....	29.613	0.612	0.613	0.611	0.608	0.607	0.605	0.612	0.619	0.627	0.633	0.638	0.639
October .....	29.647	0.646	0.644	0.644	0.643	0.639	0.639	0.643	0.649	0.658	0.669	0.675	0.674
November .....	29.690	0.691	0.689	0.687	0.684	0.681	0.676	0.679	0.685	0.695	0.705	0.715	0.718
December .....	29.971	0.972	0.971	0.966	0.965	0.961	0.953	0.952	0.958	0.968	0.976	0.991	0.993
Year .....	29.672	0.672	0.669	0.665	0.661	0.657	0.655	0.658	0.666	0.675	0.684	0.691	0.693

1900.	2 <sup>h</sup>	3 <sup>h</sup>	4 <sup>h</sup>	5 <sup>h</sup>	6 <sup>h</sup>	7 <sup>h</sup>	8 <sup>h</sup>	9 <sup>h</sup>	10 <sup>h</sup>	11 <sup>h</sup>	Mid.	Mean.	Mean max.	Mean min.
January .....	0.002	0.975	0.951	0.942	0.942	0.943	0.944	0.955	0.962	0.969	0.978	0.970	0.025	0.926
February .....	0.987	0.918	0.900	0.884	0.876	0.875	0.873	0.888	0.897	0.903	0.910	0.908	0.972	0.849
March .....	0.872	0.857	0.845	0.832	0.824	0.820	0.823	0.830	0.837	0.849	0.863	0.850	0.891	0.812
April .....	0.895	0.889	0.881	0.872	0.864	0.856	0.859	0.860	0.867	0.876	0.885	0.875	0.927	0.823
May .....	0.890	0.889	0.882	0.872	0.864	0.858	0.854	0.854	0.860	0.868	0.876	0.874	0.910	0.838
June .....	0.825	0.821	0.814	0.809	0.803	0.796	0.793	0.793	0.798	0.808	0.812	0.807	0.843	0.777
July .....	0.781	0.775	0.768	0.759	0.750	0.743	0.738	0.738	0.741	0.749	0.761	0.761	0.793	0.780
August .....	0.657	0.653	0.645	0.636	0.626	0.619	0.613	0.614	0.616	0.621	0.627	0.632	0.667	0.600
September .....	0.632	0.622	0.615	0.604	0.593	0.587	0.587	0.588	0.598	0.605	0.613	0.611	0.648	0.574
October .....	0.667	0.651	0.639	0.628	0.624	0.621	0.622	0.627	0.636	0.645	0.652	0.645	0.685	0.609
November .....	0.910	0.885	0.870	0.859	0.854	0.853	0.856	0.865	0.873	0.879	0.886	0.883	0.928	0.841
December .....	0.982	0.954	0.941	0.933	0.925	0.925	0.929	0.939	0.950	0.957	0.963	0.953	0.009	0.913
Year .....	0.888	0.874	0.863	0.852	0.845	0.841	0.841	0.846	0.852	0.860	0.869	0.864	0.908	0.824

## CLIMATOLOGY OF CALIFORNIA.

AVERAGE TEMPERATURE (DEGREES FAHRENHEIT) EACH HOUR, SEVENTY-FIFTH MERIDIAN TIME

[h<sub>1</sub>=94 ft, local time, 2<sup>h</sup> 49<sup>m</sup> slow]

1900	1 <sup>h</sup> a m	2 <sup>h</sup>	3 <sup>h</sup>	4 <sup>h</sup>	5 <sup>h</sup>	6 <sup>h</sup>	7 <sup>h</sup>	8 <sup>h</sup>	9 <sup>h</sup>	10 <sup>h</sup>	11 <sup>h</sup>	Noon	1 <sup>h</sup> p m.
January .....	56 0	55 3	54 5	54 3	53 9	53 8	53 3	53 1	53 1	52 6	53.2	55 8	58 8
February .....	55 0	54 4	53 7	53 3	52 8	52 5	52 1	52 1	52 2	52 3	54 0	57 6	60 0
March .....	58 2	57 7	57 0	56 7	56 2	55 6	55 6	54 7	54 5	54 9	56 7	59 5	61 4
April .....	56 2	55 7	54 9	54 5	54 2	53 9	53 5	52 7	52 8	54 1	56 5	58.1	59 5
May .....	59 6	59 0	58 5	58 1	57 9	57 6	57.5	56 9	56 7	57 9	59 1	60 7	62 1
June .....	62 9	62 6	62 1	61 9	61 8	61 6	61 2	60 6	60 7	61 5	62 6	64 0	65 7
July .....	65 5	65 2	65 0	64 8	64 7	64 5	64 2	64 1	64 4	65 3	66 5	68 0	69.5
August .....	64 5	64 2	63 9	63 9	63 9	63 7	63 5	63 2	63 1	63 9	65 3	66 5	68 0
September .....	63 6	63 2	62 4	62 1	61 5	61.2	61 1	60 8	60 9	62 1	64 7	66.6	68 7
October .....	61 4	60 9	60 2	60 0	59 9	59 6	59 3	58 9	58 6	58 8	61 3	63 3	65 5
November .....	60 8	60 7	60 4	60 2	59 6	59 5	59 4	59 9	58 8	59 0	61 4	64 1	67 1
December .....	57 3	56 9	56 2	56 0	55.1	54 7	54 4	54.4	54 4	53 9	55 0	58 7	63 2
Year .....	60 1	59 6	59 1	58 8	58 5	58 2	57 9	57 6	57 5	58 0	59 7	61 9	64 2

1900	2 <sup>h</sup>	3 <sup>h</sup>	4 <sup>h</sup>	5 <sup>h</sup>	6 <sup>h</sup>	7 <sup>h</sup>	8 <sup>h</sup>	9 <sup>h</sup>	10 <sup>h</sup>	11 <sup>h</sup>	Mid	Mean.	Mean max	Mean min.
January .....	60 6	62 3	62 4	62 5	62 3	61 5	60 3	59 4	58 5	57 3	56 5	57 1	63 7	61 8
February .....	62 1	63 4	63 3	63 6	63 2	62 4	61 3	59 8	58 6	57 0	55 9	57 2	64 6	60 7
March .....	62 4	63 6	63 4	63 3	63 2	62.7	62 0	60 9	60 0	59 5	58 8	59.1	61 5	61.0
April .....	60 2	60 9	60 9	60 5	60 8	60 1	59 3	58 6	57 8	57 3	56 8	57.1	61 7	62 0
May .....	62 6	63.7	64 3	64 5	64 4	63 8	63 8	62 8	61 6	60 7	60 2	60 6	65 5	66.3
June .....	66 4	67 3	67.2	67 1	66 9	66.6	65 8	65 4	64 6	63 8	63 3	63 9	68 8	69 1
July .....	69 9	70 7	70 9	70 6	70 3	69.7	69 0	68 3	67 1	66 1	66 2	67 1	71.7	73.5
August .....	68 4	68 6	68 7	68 8	68 6	68 0	67 5	66 4	65 4	64 9	64 6	65 7	70 0	72 5
September .....	69 3	69 9	70 1	70 1	69 7	69 0	68 3	66 9	65 9	65 0	64 3	65.3	71 1	73 1
October .....	66 5	67 1	67 2	67 2	66 9	66 2	65 0	64 2	63 5	62 9	62.1	62 8	68 3	70 9
November .....	69 5	70 0	69 6	69 9	69 5	68 7	68 0	67 4	66 7	65 8	64.9	63 7	72 1	74 2
December .....	65 5	67 0	67 2	66 6	66 8	65 7	63 7	61.9	60 3	59 0	58 1	59 7	68 5	72 3
Year .....	65 3	66 2	66 3	66 2	66 0	65.4	64 4	63.3	62 2	61.4	60 7	61.6	67 5	70.5

## SUNSHINE FOR THE YEARS 1898, 1899, AND 1900

[N lat 32° 43']

	Percentage of sunshine recorded during hours ending (local time)—																Total (hours)	Percentage of possible
	5 <sup>h</sup> a m	6 <sup>h</sup>	7 <sup>h</sup>	8 <sup>h</sup>	9 <sup>h</sup>	10 <sup>h</sup>	11 <sup>h</sup>	Noon	1 <sup>h</sup>	2 <sup>h</sup>	3 <sup>h</sup>	4 <sup>h</sup>	5 <sup>h</sup>	6 <sup>h</sup>	7 <sup>h</sup>	8 <sup>h</sup>		
1898																		
January .....	...	...	74	66	64	73	75	70	73	72	74	71	60	60	...	...	921.5	70
February .....	...	...	46	51	65	68	76	86	87	85	79	82	75	70	...	...	229.6	71
March .....	...	89	68	60	64	71	78	85	84	85	81	75	70	71	85	...	276.4	71
April .....	...	35	38	41	56	64	71	76	76	86	83	80	74	62	52	...	255.2	65
May .....	47	32	31	35	44	56	66	73	77	83	82	76	72	63	57	80	260.1	60
June .....	21	20	22	26	31	51	76	87	87	84	86	80	70	59	40	33	248.4	58
July .....	29	17	18	30	53	66	77	91	93	93	93	90	83	80	71	68	299.6	69
August .....	...	31	36	33	67	84	92	96	98	97	96	98	95	83	41	...	317.9	77
September .....	...	54	49	61	71	78	86	93	96	95	95	94	91	88	93	...	306.5	83
October .....	...	67	37	37	50	71	89	93	96	96	94	89	82	81	...	...	268.7	76
November .....	...	...	81	80	88	93	96	97	92	93	95	94	93	88	...	...	287.2	91
December .....	...	...	76	73	74	76	79	82	80	84	80	76	73	100	...	...	241.7	78
Sum .....	97	345	571	593	727	851	961	1,027	1,039	1,053	1,038	1,005	938	905	439	181	3,913.1	875
Percentage of possible .....	...	...	48	49	61	71	80	80	87	88	86	84	78	75	...	...	326.1	73

## SUNSHINE FOR THE YEARS 1898, 1899, AND 1900—Continued.

[N. lat 32° 43'.]

Percentage of sunshine recorded during hours ending (local time)—

	5 <sup>h</sup> a. m.	6 <sup>h</sup>	7 <sup>h</sup>	8 <sup>h</sup>	9 <sup>h</sup>	10 <sup>h</sup>	11 <sup>h</sup>	Noon.	1 <sup>h</sup>	2 <sup>h</sup>	3 <sup>h</sup>	4 <sup>h</sup>	5 <sup>h</sup>	6 <sup>h</sup>	7 <sup>h</sup>	8 <sup>h</sup>	Total (hours).	Per- centage of pos- sible.
1899.																		
January .....			22	64	65	75	75	79	80	83	85	84	81	81	.....		245.4	77
February .....			47	54	63	79	79	88	88	89	88	84	79	78	.....		241.0	78
March .....		22	49	52	60	66	79	86	89	86	89	90	85	79	60	.....	284.7	76
April .....		40	37	40	54	70	89	86	90	91	86	84	84	64	57	.....	277.6	71
May .....	20	28	28	31	47	66	74	82	87	90	89	86	76	56	51	0	274.8	64
June .....	11	10	9	24	42	52	66	70	74	74	78	77	72	64	38	37	227.6	58
July .....	0	7	16	37	68	77	90	90	90	97	97	95	92	82	87	86	323.4	74
August .....		17	17	36	74	91	94	96	96	97	97	95	90	89	87	.....	324.4	78
September .....		21	19	28	50	65	80	88	90	91	91	89	87	81	87	.....	262.4	71
October .....		0	44	54	60	72	78	78	79	80	81	82	81	80	.....		258.8	72
November .....			60	59	58	59	70	81	83	84	77	76	69	75	.....		223.6	71
December .....			68	68	77	80	78	79	79	75	79	74	69	18	.....		235.6	76
Sum .....	31	145	416	547	718	852	952	1,008	1,025	1,037	1,037	1,016	965	847	467	123	3,174.3	861
Percentage of pos- sible .....			35	46	60	71	79	84	85	86	86	85	80	71	.....		264.5	72
1900.																		
January .....			0	47	51	64	82	80	81	84	79	74	65	60	.....		224.7	71
February .....			68	70	75	84	94	91	90	92	96	92	79	72	.....		262.1	85
March .....		44	42	48	52	61	66	71	79	84	81	75	61	61	68	.....	244.2	66
April .....		57	50	53	62	79	76	79	77	78	79	72	68	66	57	.....	269.1	69
May .....	7	27	28	41	42	62	74	82	80	84	92	87	76	71	68	100	280.7	65
June .....	4	4	5	15	32	44	57	70	72	74	74	74	72	60	53	56	215.3	50
July .....	0	18	16	27	53	81	85	90	96	95	96	92	88	79	66	64	305.9	70
August .....		11	15	21	42	62	85	95	92	92	89	86	80	73	53	.....	272.0	66
September .....		33	43	48	54	80	80	83	89	89	90	88	87	87	100	.....	282.1	76
October .....		67	42	45	48	60	72	83	85	85	82	86	83	83	.....		248.8	71
November .....		49	47	71	77	78	82	80	83	82	70	60	100	.....			226.8	72
December .....		84	77	90	95	92	90	94	92	96	93	90	100	.....			282.1	91
Sum .....	11	256	442	539	672	849	941	996	1,015	1,032	1,036	989	912	912	465	220	3,113.1	852
Percentage of pos- sible .....			37	45	56	71	78	83	85	86	86	82	76	76	.....		259.4	71

## EXCESSIVE PRECIPITATION.

Stations and dates.	Total duration.		Total amount of precipitation (inches).	Excessive rate.		Amount before excessive rate began (inches).	Accumulated depths of precipitation (in inches) during periods of time indicated.													
	From—	To—		Began—	Ended—		5 min.	10 min.	15 min.	20 min.	25 min.	30 min.	35 min.	40 min.	45 min.	50 min.	60 min.	80 min.	100 min.	120 min.
San Diego, Cal.: Jan. 10, 1899 .....	6.05 p. m.	11.59 p. m.	1.20	10.50 p. m.	11.30 p. m.	0.50	0.15	0.26	0.29	0.37	0.40	0.46	0.55	0.60	0.62	0.65	0.70	.....	.....	.....





# CLIMATOLOGY OF THE GREAT VALLEY.

## RED BLUFF.

Data by Mr. MAURICE CONNELL, Observer, Weather Bureau.

Red Bluff is the county seat of Tehama County, at the northern end of the Sacramento Valley. The city is situated on the western bank of the Sacramento River, the average elevation above sea level being 309 feet, and is in latitude  $40^{\circ} 10'$  north, longitude  $122^{\circ} 14'$  west. The land slopes gently to the river, and within a radius of 5 miles the country is comparatively flat. The general movement of the air is from the north and northeast into the valley from the mountains on the north and east. During the summer months, however, there is a well-marked southerly movement of the air, which is in part due to the strong westerly indraft through the Golden Gate and its subsequent deflection northward through the valley. The highest temperature recorded is  $114^{\circ}$  and the lowest  $18^{\circ}$ . The average annual precipitation is 25.56 inches.

### MONTHLY AND ANNUAL MEAN TEMPERATURE (DEGREES F.).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1878 .....	47.3	50.2	55.5	60.4	67.4	81.0	81.6	83.2	72.9	65.4	55.6	47.4	64.0
1879 .....	44.6	53.6	57.0	61.3	62.5	78.7	81.6	83.4	77.2	64.0	51.0	44.6	68.8
1880 .....	44.5	46.5	49.7	55.8	64.1	73.9	83.4	77.4	74.7	65.3	50.0	49.4	61.2
1881 .....	50.0	53.0	55.6	63.6	69.3	72.8	78.7	76.4	71.5	57.5	51.0	45.9	62.1
1882 .....	44.1	44.4	52.5	56.6	67.4	75.6	84.3	81.2	60.3	58.3	51.3	47.5	60.2
1883 .....	41.2	45.1	58.3	56.3	64.3	80.3	84.9	79.9	75.4	57.7	50.6	44.4	61.5
1884 .....	46.2	45.9	51.6	56.8	68.0	69.6	78.4	81.5	67.3	62.1	54.7	47.5	60.8
1885 .....	47.5	53.5	61.0	62.1	70.4	71.6	80.7	83.8	74.8	65.6	52.7	49.3	64.4
1886 .....	46.2	54.5	52.8	57.7	66.9	79.1	82.6	81.5	75.6	60.7	51.3	50.0	68.2
1887 .....	48.7	43.4	58.9	60.2	68.8	77.1	85.9	81.3	76.4	71.1	55.2	48.2	64.4
1888 .....	40.9	53.9	54.5	67.0	68.1	70.7	80.9	83.7	81.2	68.2	54.8	48.3	64.5
1889 .....	45.8	51.6	56.8	61.0	66.8	80.0	81.3	80.0	76.0	61.4	54.4	44.8	63.3
1890 .....	39.2	45.2	50.8	60.3	67.6	72.6	80.4	79.5	74.4	65.0	57.9	45.0	61.5
1891 .....	48.5	44.4	55.0	57.8	66.3	72.2	82.6	83.1	72.9	66.0	56.8	42.5	62.4
1892 .....	47.1	53.0	56.0	54.1	65.6	71.8	78.7	80.4	72.0	68.5	56.1	47.6	62.2
1893 .....	48.2	46.8	49.8	54.6	65.8	73.4	80.4	81.0	67.5	61.4	53.5	50.2	60.6
1894 .....	42.4	45.3	51.5	61.4	66.8	69.1	83.0	82.0	74.8	63.9	59.0	45.0	62.0
1895 .....	43.8	52.8	52.8	59.1	66.2	78.2	80.0	81.2	68.5	67.0	53.6	48.4	62.2
1896 .....	48.8	53.2	53.8	52.2	61.0	77.4	85.3	78.8	72.8	67.2	50.8	49.0	62.5
1897 .....	45.8	47.0	54.4	63.2	72.6	74.0	82.1	80.2	72.6	62.9	49.7	46.0	62.0
1898 .....	42.4	51.0	59.2	64.4	63.6	75.4	83.1	81.3	72.6	64.3	53.6	45.7	62.5
1899 .....	48.8	51.6	52.2	60.8	63.2	77.9	82.0	73.8	78.0	61.0	54.4	45.5	62.4
1900 .....	48.8	51.1	58.6	57.6	67.0	76.8	82.6	77.0	69.9	60.0	54.8	45.4	62.5
Means (23 years) .....	45.3	49.4	54.8	59.2	66.6	75.1	81.9	80.9	72.8	63.5	53.6	46.6	62.4

CLIMATOLOGY OF CALIFORNIA.

SUMMARY OF MONTHLY MEANS AND EXTREMES OF TEMPERATURE

Month	Highest monthly mean		Lowest monthly mean		Absolute maximum		Absolute minimum		Mean daily range	Mean daily variability of mean temperature.	Mean relative humidity at 5 a m	Mean relative humidity at 5 p m
	Temperature	Date	Temperature	Date	Temperature	Date	Temperature	Date				
											Per cent	Per cent
January .. . . .	50 0	1881	39 2	1890	77 0	27,1899	18 0	14,1888	15 6	3 6	87 0	68 0
February .....	54 5	1886	43 4	1887	82 0	25,1888	22 0	14,1884	18 9	3 1	82 0	56 0
March .....	61 0	1885	49 7	1880	86 0	9,1892	28 0	16,1880	19 2	3 0	82 0	53 0
April .. . . .	67 0	1888	54 1	1892	96 0	24,1898	34 0	18,1885	22 2	3 3	76 0	43 0
May .. . . .	72 6	1897	61 0	1896	110 0	29,1887	38 0	11,1892	24 1	3 9	71 0	38 0
June .. . . .	81 0	1878	69 6	1884	110 0	30,1891	44 0	1,1898	27 1	3 5	59 0	26 0
July .. . . .	85 9	1887	78 4	1884	112 0	8,1887	53 0	1,1881	30 5	3 2	49 0	18 0
August .. . . .	88 8	1885	73 8	1889	114 0	22,1891	52 0	22,1881	30 6	3 0	49 0	20 0
September .....	81 2	1888	60 3	1882	107 0	1,1891	46 0	9,1884	26 7	3 2	57 0	28 0
October .. . . .	71 1	1887	57 5	1881	97 0	5,1892	32 0	14,1881	24 6	3 3	67 0	38 0
November .....	59 0	1894	49 7	1897	88 0	3,1890	26 0	30,1880	21 4	3 5	75 0	55 0
December .....	50 2	1893	42 5	1891	79 0	5,1885	25 0	13,1884	13 4	3 5	87 0	70 0
Annual .. . . .	85 9	....	39 2	....	114 0	....	18 0	....	22 8	3 3	70 0	43 0

PRECIPITATION EXCEEDING 2 50 INCHES IN ANY CONSECUTIVE 24 HOURS

	Inches		Inches		Inches
January 16, 1878 .....	5 11	December 14, 1881 . . . . .	2 89	December 15, 1896 . . . . .	2 64
December 5, 1879 .....	5 04	November 3, 1882 . . . . .	2 88	January 10, 1899 . . . . .	4 04
January 29, 1881 .....	3 25	November 10, 1885 . . . . .	4 73		

MONTHLY AND ANNUAL PRECIPITATION (INCHES AND HUNDREDTHS)

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1878 .. . . .	20 71	16 66	4 16	2 26	0 89	0 00	0 00	0 00	0 42	1 56	1 66	0 69	49 11
1879 .. . . .	3 18	3 67	5 89	2 12	2 18	0 30	0 04	0 28	T	0 48	6 05	9 95	33 64
1880 .. . . .	2 01	1 66	1 70	7 05	1 04	0 00	0 00	0 00	0 00	0 08	0 14	12 85	26 53
1881 .. . . .	9 40	2 79	0 51	1 83	0 79	0 51	T	0 00	1 07	1 61	0 73	5 69	24 93
1882 .. . . .	2 81	3 94	2 67	2 12	0 33	0 15	0 00	0 00	0 49	2 80	5 07	1 44	21 82
1883 .. . . .	0 87	0 39	2 60	1 96	2 96	T	0 00	T	1 04	2 68	0 74	0 52	13 76
1884 .. . . .	3 55	2 21	7 81	4 81	0 18	0 97	0 00	T	0 86	0 90	0 04	7 73	28 06
1885 .. . . .	1 84	1 19	T	0 62	0 64	1 37	0 05	0 00	2 91	0 10	17 05	3 86	29 63
1886 .. . . .	4 85	0 18	1 31	4 12	0 78	T	T	T	0 00	1 76	0 34	3 92	17 21
1887 .. . . .	0 57	5 21	1 13	1 76	0 77	0 26	T	T	0 06	0 00	1 52	2 32	13 60
1888 .. . . .	4 08	2 17	3 47	0 53	0 51	2 61	0 07	0 00	0 33	T	4 32	6 85	24 91
1889 .. . . .	0 51	0 71	6 88	1 11	2 04	0 64	0 00	0 00	0 00	8 41	3 37	9 25	32 87
1890 .. . . .	6 55	3 67	6 14	1 70	2 67	0 11	0 00	0 00	1 55	0 01	0 00	3 20	25 60
1891 .. . . .	1 36	10 68	1 42	2 27	1 50	0 55	0 17	0 00	0 19	0 64	0 46	3 80	23 01
1892 .. . . .	4 30	3 11	2 69	2 92	3 02	0 27	T	T	0 29	1 42	7 25	8 21	33 48
1893 .. . . .	3 82	3 22	6 08	1 42	0 61	0 00	0 03	0 00	1 23	1 09	4 22	2 64	24 36
1894 .. . . .	5 29	2 30	2 40	0 55	1 46	1 00	0 02	T	1 11	0 89	0 95	11 01	26 98
1895 .. . . .	3 29	2 86	2 59	0 34	1 65	0 00	0 16	0 00	1 76	T	1 93	2 99	22 77
1896 .. . . .	7 30	0 27	3 06	3 67	2 42	T	0 00	0 54	0 63	0 66	3 41	6 20	28 46
1897 .. . . .	3 22	6 26	1 99	1 22	0 06	1 25	0 00	T	0 03	2 70	1 49	1 86	20 78
1898 .. . . .	0 59	5 45	0 01	0 68	2 28	0 14	0 00	T	0 45	0 46	1 21	1 69	12 91
1899 .. . . .	9 29	0 01	6 22	0 72	0 69	0 94	0 00	0 02	0 00	3 02	4 08	3 08	28 07
1900 .. . . .	4 51	1 62	2 38	2 69	1 18	0 94	0 00	0 05	0 21	3 25	3 23	2 07	21 77
Average (23 years) .. . . .	4 72	3 48	3 15	2 08	1 33	0 51	0 02	0 04	0 65	1 48	2 96	5 26	25 40



CLIMATOLOGY OF CALIFORNIA.

ANNUAL METEOROLOGICAL SUMMARY FOR THE YEARS 1899 AND 1900

[λ=40° 10' N , φ=122° 15' W , gravity corr , -0.01 ]

Month	Pressure			Temperature								Moisture										
	Monthly mean	Extremes		Mean					Extremes		Dew-point	Relative humidity		Vapor pressure		Precipitation		Cloudiness				
		Maximum	Minimum	8 a m	8 p m	Maximum	Minimum	Monthly	Maximum	Minimum		8 a m	8 p m	8 a m	8 p m	8 a m	8 p m	Total	Maximum in 24 hours	8 a m	8 p m	Daylight
1899	In	In	In	o	o	o	o	o	o	o	o	o	%	%	In	In	In	In				
January . . .	29 78	30 08	28 89	43 9	53 7	56 2	41 4	48 8	77	30	38	38	82	65	0 281	0 236	9 29	4 04	4 6	6 2	6 0	
February . .	29 79	30 16	29 81	43 4	60 2	62 0	41 1	51 6	79	26	32	30	66	34	0 185	0 173	0 01	0 01	1 6	4 1	3 0	
March . . . .	29 65	30 09	29 27	45 7	58 6	60 7	43 6	52 2	75	36	40	40	81	56	0 250	0 261	6 22	1 56	5 3	5 5	5 9	
April . . . .	29 63	29 80	29 35	50 7	69 9	72 2	49 4	60 8	87	39	44	44	79	43	0 291	0 310	0 72	0 18	2 2	4 1	3 4	
May . . . .	29 60	29 84	29 37	53 0	72 8	74 5	51 8	63 2	96	38	58	37	61	30	0 252	0 226	0 69	0 34	2 8	4 3	3 5	
June . . . .	29 52	29 67	29 33	65 3	89 7	91 6	64 2	77 9	107	51	44	40	50	21	0 294	0 261	0 91	0 79	1 3	1 1	1 2	
July . . . .	29 48	29 63	29 31	67 7	97 1	98 2	65 9	82 0	109	60	45	43	46	16	0 304	0 282	0 00	0 00	0 2	0 3	0 4	
August . . .	29 50	29 61	29 33	62 7	86 3	87 3	60 4	73 8	100	55	44	43	52	24	0 297	0 288	0 02	0 02	0 0	2 2	1 6	
September . .	29 57	29 69	29 40	64 6	92 3	93 8	62 2	78 0	106	53	39	37	42	16	0 246	0 227	0 00	0 00	0 6	1 0	0 8	
October . . .	29 61	29 91	29 11	53 2	68 7	71 4	50 7	61 0	94	42	40	39	66	42	0 250	0 248	3 02	1 02	3 1	4 2	3 6	
November . .	29 67	29 90	29 29	49 5	58 0	60 8	48 0	54 4	73	41	47	50	92	76	0 327	0 362	4 08	1 00	5 9	6 7	6 9	
December . .	29 78	30 17	29 34	41 1	49 1	52 5	38 5	45 5	70	27	38	40	90	75	0 233	0 254	3 80	1 54	3 4	4 3	5 7	
Year . . . .	29 63	30 17	28 89	53 4	71 4	73 4	51 4	62 4	109	26	41	40	68	42	0 263	0.261	28 79	4 04	2 7	3 7	3 5	
1900																						
January . . .	29 78	29 99	29 45	49 9	52 6	54 4	43 2	48 8	69	33	43	45	93	78	0 277	0 308	4 15	1 58	4 6	4 2	6 6	
February . .	29 77	30 02	29 47	45 1	58 2	59 5	42 7	51 1	73	35	40	42	83	60	0 248	0 275	1 62	0 69	2 8	5 2	4 9	
March . . . .	29 62	29 93	29 40	50 1	67 4	68 6	48 6	58 6	84	38	42	45	78	50	0 278	0.314	2 38	0 83	3 8	4 8	4 2	
April..... .	29 59	29 78	29 33	49 2	65 8	67 9	47 3	57 6	84	39	41	40	76	43	0.261	0 259	2 69	0 90	2 7	4 4	3 8	
May . . . .	29 58	29 75	29 37	56 5	76 7	78 5	55 4	67 0	92	46	45	42	69	34	0.304	0 279	1 18	0 43	3 6	4 3	3 9	
June . . . . .	29 51	29 73	29 35	64 5	87 9	90 4	63 1	76 8	104	53	50	49	60	30	0 363	0.356	0 94	0 54	2 0	3 0	2 2	
July . . . . .	29 44	29 70	29 23	68 6	96 8	98 2	67 0	82 6	109	60	48	45	48	18	0.334	0 303	0 00	0 00	0 3	0 5	0 3	
August.....	29 51	29 76	29 26	65 2	88 9	90 5	63 5	77 0	104	56	46	43	53	22	0.316	0 281	0 05	0 05	0 6	1 4	1 0	
September . .	29 55	29 83	29 26	60 4	79 5	81 2	58 6	69 9	100	52	45	40	61	28	0 315	0 286	0 21	0 14	3 3	2 4	2 3	
October . . . .	29 61	29 89	29 30	51 5	67 8	69 9	50 1	60 0	87	40	46	46	83	49	0 314	0 316	3.25	0.88	2 8	4 0	3 8	
November . .	29 67	29 99	29 00	47 7	60 6	64 1	45 4	54 8	82	38	44	48	90	66	0.295	0 338	3.23	1.76	4 1	5 2	5.1	
December... .	29 84	29 99	29 53	41 8	49 2	51 4	39 5	45 4	67	29	39	42	92	78	0 244	0 269	2.07	1 25	4 2	3 9	6 3	
Year . . . .	29 62	30 02	29 00	53 8	71 0	72 9	52 0	62 5	109	29	44	44	74	46	0 296	0 297	21.77	1 70	2 9	3 6	3 7	

DATES OF FIRST AND LAST KILLING FROSTS FROM 1882 TO 1899, INCLUSIVE

Year	Last in spring	First in autumn	Year.	Last in spring.	First in autumn	Year	Last in spring.	First in autumn
1882 . . . . .	Mar 20	Nov 12	1889 . . . . .	Feb 17	Dec 27	1895 . . . . .	Mar. 14	Nov. 25
1883 . . . . .	Feb 17	Nov. 25	1890 . . . . .	Feb 27	Dec 10	1896 . . . . .	Apr 19	Nov 28
1884. . . . .	Mar 11	Dec 11	1891 . . . . .	Feb 25	Dec 5	1897 . . . . .	Mar 30	Nov 7
1885. . . . .	Feb 9	Dec 21	1892 . . . . .	Feb 9	Nov 24	1898 . . . . .	Mar 24	Nov 20
1886... . . . .	Mar 1	Nov 21	1893. . . . .	Mar 13	Nov 19	1899 . . . . .	Feb 7	Dec 19
1887 . . . . .	Feb 27	Nov 24	1894. . . . .	Mar 4	Nov 23	1900 . . . . .	....	Dec. 29
1888 . . . . .	Mar 3	Dec 6						

## CLIMATOLOGY OF THE GREAT VALLEY.

97

## ANNUAL METEOROLOGICAL SUMMARY FOR THE YEARS 1899 AND 1900—Continued.

[H = 332 ft.; h<sub>1</sub> = 54 ft.; h<sub>2</sub> = 44 ft.; h<sub>3</sub> = 58 ft.].

Month.	Wind.										Number of days.																
	By self-registers.				Number of winds, 8 a. m. and 8 p. m.						Precipitation.		Maximum temperature.		Minimum temperature below 32°.		Thunderstorms.		Electricity.								
	Average hourly velocity.	Prevailing direction.	Maximum velocity.	Direction at time of maximum velocity.	Number of days with gales.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calm.	Clear.	Partly cloudy.	Cloudy.	0.01 inch and over.	0.04 inch and over.	Snow.	Hail.	Fog.	Below 32°.	Above 32°.	Minimum temperature below 32°.	Thunderstorms.	Auroras.
1899.	Miles.		Mi.																								
January .....	7.8	N.	36	SE.	0	21	0	0	8	8	4	3	18	0	10	6	15	13	13	0	0	3	0	0	4	0	0
February .....	8.6	N.	34	SE.	0	27	1	1	9	3	1	8	6	0	19	8	1	1	0	0	0	0	0	5	0	0	
March .....	8.1	SE.	36	SE.	0	14	2	3	18	10	1	5	6	3	8	12	11	16	14	0	1	1	0	0	0	1	0
April .....	6.9	N.	34	NW.	0	15	0	2	10	14	0	7	12	0	18	7	5	4	3	0	0	0	0	0	0	0	0
May .....	7.5	SE.	30	SE.	0	18	2	5	21	3	2	4	7	0	19	7	5	6	4	0	0	0	0	1	0	0	0
June .....	7.9	N.	34	N.	0	26	1	2	12	3	1	1	14	0	27	1	2	2	2	0	0	0	0	18	0	0	0
July .....	5.1	SE.	24	N.	0	11	1	0	27	8	2	3	8	2	31	0	0	0	0	0	0	0	0	30	0	0	0
August .....	6.1	SE.	24	N.	0	9	0	1	31	10	2	2	6	1	24	7	0	1	0	0	0	0	0	8	0	0	0
September .....	5.4	N.	36	N.	0	18	4	2	17	5	1	0	13	0	30	0	0	0	0	0	0	0	0	22	0	0	0
October .....	7.4	N.	42	SE.	1	18	1	2	11	8	5	3	14	0	19	5	7	8	8	0	0	0	0	3	0	1	0
November .....	5.4	SE.	34	SE.	0	5	3	3	22	9	0	5	12	1	6	7	17	15	14	0	0	1	0	0	0	0	0
December .....	5.2	SE.	34	SE.	0	15	2	5	17	3	8	5	11	1	8	14	9	13	12	0	0	11	0	0	2	0	0
Year .....	6.8	SE.	42	SE.	1	197	17	26	203	84	22	46	127	8	219	74	72	79	70	0	1	16	0	82	11	2	0
1900.																											
January .....	4.6	SE.	26	N.	0	13	3	1	18	7	1	7	10	2	6	8	17	12	8	0	0	15	0	0	0	0	0
February .....	5.6	N.	34	N.	0	19	1	4	13	4	2	2	11	0	12	8	8	9	5	0	0	2	0	0	0	2	0
March .....	6.8	N.	35	SE.	0	21	0	1	19	7	3	3	8	0	15	9	7	7	6	0	0	0	0	0	0	1	0
April .....	7.5	N.	30	N.	0	21	0	1	18	4	2	6	8	0	18	5	7	10	8	0	0	0	0	0	0	0	0
May .....	5.9	N.	24	N.	0	20	6	1	18	5	2	0	9	1	17	7	7	5	5	0	0	0	0	3	0	1	0
June .....	5.2	SE.	25	N.	0	13	0	2	26	3	1	4	7	4	22	5	3	4	4	0	0	0	0	16	0	1	0
July .....	4.7	SE.	21	N.	0	16	3	8	20	6	0	3	6	0	31	0	0	0	0	0	0	0	0	29	0	0	0
August .....	5.4	SE.	24	N.	0	17	1	1	30	7	1	2	2	1	29	2	0	1	1	0	0	0	0	13	0	1	0
September .....	7.3	N.	37	N.	0	26	0	0	21	6	0	3	3	1	21	7	2	2	2	0	0	0	0	4	0	1	0
October .....	6.6	N.	35	SE.	0	23	1	1	18	4	0	1	11	3	18	4	9	9	8	0	0	0	0	0	0	0	0
November .....	4.4	N.	24	SE.	0	20	2	4	14	0	0	2	16	2	14	6	10	10	8	0	0	2	0	0	0	1	0
December .....	4.4	SE.	35	SE.	0	22	0	4	25	1	3	2	2	3	9	6	16	9	8	0	0	14	0	0	2	0	0
Year .....	5.7	SE.	37	N.	0	231	17	28	240	54	15	35	93	17	212	67	86	78	63	0	0	33	0	65	2	8	0

## SACRAMENTO.

Excellent records of temperature and rainfall are available for the city of Sacramento. This city may in a climatological sense be called the most representative city of the great valley. San Francisco, Sacramento, and Stockton form as it were the three central points of the bay and valley district. It will be noticed that the mean annual temperatures are respectively about 56°, 60°, and 60°. In other words the valley cities have a mean annual temperature about 4° higher than the coast city has. In January the mean temperature of the interior cities is nearly 4° below that of San Francisco. In March it is slightly above. In April nearly 4° above, which increase continues until October. During July there is a difference of nearly 15°. While the annual rainfall at San Francisco is 23 inches, that at Sacramento is 19.21 inches, and at Stockton 15.54 inches. There is thus a gradual decrease in the rainfall from the coast inland. December is the month of heaviest rainfall at all stations and August the month of least precipitation. With regard to the seasonal rainfall it may be stated that years in which the rainfall is well distributed, particularly where good rains fall in March and April, are years of large wheat yields.

## CLIMATOLOGY OF CALIFORNIA.

The following data, showing the temperature and weather conditions of Sacramento, were compiled by Mr. J. A. Barwick, of the Weather Bureau, from the records of Dr. T. A. Logan; Dr. F. M. Hatch; Mr. S. H. Gerrish, and the Weather Bureau.

## MEAN MONTHLY AND ANNUAL TEMPERATURE (DEGREES FAHRENHEIT)

Years	Jan	Feb	Mar	Apr.	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1853	43 0	50 0	59 8	61 0	68 0	77 0	75 0	71 0	76 0	78 0	53 0	48 0	63 3
1854	43 0	51 0	58 0	60 0	62 0	67 0	80 6	69 5	65 0	60 0	55 0	47 9	59 5
1855	43 7	52 5	54 8	58 1	60 2	71 1	72.6	78 0	68 0	63 0	50 0	46.0	59 5
1856	48 0	52 6	57 0	58 8	63 9	71 1	75 1	69 6	70 9	58 0	52 2	43 9	60 1
1857	48 5	50 2	56 4	63.3	65 5	71 9	71 4	71 3	67 9	61 5	53 2	47 4	60 7
1858	45 0	52 2	53 7	59 8	65 2	69 4	70 8	70 6	68 9	59 5	54 2	44 5	59 5
1859	44 9	50 5	51 5	57 1	63 0	74 8	69 1	67 2	65 9	63 3	54 0	43 5	58 7
1860	46 2	49 8	53 3	57 8	58 5	65 6	73 2	73.5	67 6	59 8	53 5	49 3	59.0
1861	47 1	52 2	55 0	60 6	63 7	66 2	73 6	69 7	67.8	59 9	53 6	50 9	60 1
1862	46 4	47 5	53 6	58 0	61 2	69 3	73 2	75 0	70 4	67 6	53 2	46 4	60 2
1863	46 9	48 0	57 6	59 5	67 1	69 1	75 6	70 7	69 0	62 8	52 7	46 5	60 4
1864	49 2	53 6	56 1	62 1	68 5	71 1	74 8	74 7	69 8	64 5	53 5	50 2	62 8
1865	47 4	49 0	53 6	59 4	70 2	73 5	74 0	71 7	68 8	63 1	56 9	44 1	61 0
1866	46 5	53 5	54 2	61 9	63 1	72 2	76 2	76 0	72 2	65 2	53 8	50 2	62.1
1867	48 2	47 8	50 7	59 7	64.4	70 3	73 8	71 7	68 8	62 7	54 8	46 8	59 9
1868	47 0	50 5	55 0	60 1	64 2	69 5	73 8	71 2	68 3	62 0	53 9	47 0	60 1
1869	47 6	49 9	53 6	59 0	64 2	70 8	74 4	71 3	69 9	63 1	54 0	46 5	60 4
1870	48 6	51 1	53 0	57 0	61 0	69 3	71 8	72 6	68 0	63 6	53 4	45.5	59 6
1871	48 3	49 4	56 0	59 2	61 5	70 1	70 2	72 0	67 4	62 2	50.2	48.7	59 6
1872	48 5	53 3	56 8	57 6	67 0	69 2	71 4	73 1	68 8	58 9	51 2	49 0	60 4
1873	52 7	48 2	56 8	60 0	67 9	71 7	73 2	66 3	69 9	61 4	57 5	47.7	60 7
1874	45.7	49 3	52 9	59 5	64 7	70 2	72 8	70 9	70 7	61 7	58.9	45.0	59 8
1875	46 9	52 7	58 7	63 0	68 1	70 6	73 3	72 5	65.7	69.9	56.7	48.0	62 2
1876	48 8	50 2	54 6	59 5	65 7	76 9	74 0	72 8	70 1	63 5	53 3	45.5	61.2
1877	49 1	55 0	59 0	60 2	64 5	72 5	75 6	73 0	72 3	62.1	53 5	47.8	62 0
1878	48 6	51 0	56 5	58 9	65 6	72 2	73 6	73 7	68 7	61.9	54 3	46.0	60 9
1879	44 8	54 4	57 0	60 4	60 8	72 8	72 6	75 6	71 3	61 3	50 8	43.5	60 4
1880	43 0	45 7	49 2	55 0	62.0	67.8	72.7	71 1	69 1	62.4	49.3	50.0	58 1
1881	49 0	53 5	55 8	62 3	66 6	68 2	78 0	70 4	68 9	57 6	50 2	46.2	60 1
1882	45 8	46 5	53 6	56 6	65 0	69 0	75 3	74 1	69 9	58 8	49 6	47 9	59.4
1883	41 8	45 9	58 2	56.6	63 6	74 1	75 7	71 0	73 5	59 0	51.2	44.8	59 9
1884	46 8	47 5	53 7	57 6	65 6	67 0	72 7	74 9	66 6	60 8	56 1	48 9	59.8
1885	47 3	54 4	60 4	61 3	67 3	67 9	73 0	75 9	72 2	65 6	54.8	49 3	62 5
1886	46 2	54.2	52 5	56 8	63 8	71 2	74 3	74 4	70 0	58.8	50 8	49 9	60 3
1887	48 6	44 9	58 2	59 2	63 2	69 8	71 4	69 8	70.8	66.5	54.5	46 5	60 3
1888	42 8	53 0	53 6	63 0	62 7	68 0	73 3	76 8	75 5	65 2	54 2	48 5	61 4
1889	44 7	50 2	57 4	61 2	64 2	70 1	72.8	74 0	71 9	61.7	54 2	48 5	60.9
1890	42 6	47 4	52 6	59 0	65 4	67 8	73 8	72 8	70 4	63.4	54.8	48.2	59 4
1891	46 9	48 2	56 0	57 0	62 7	69 0	76 4	76 1	69 8	64.5	55.9	44 2	60 0
1892	48 4	52 2	55 9	55 4	63 2	68 0	72.0	73 0	68 8	62.0	55.3	48 2	60 2
1893	42 1	48 3	52 0	55 7	63 7	68 5	74 0	74 1	65 4	60 2	53.6	48.6	58 8
1894	44 4	47 2	53 3	61 3	63 7	64 8	74 0	74 6	71.8	63 4	58 2	46 9	60.3
1895	46 4	53 4	53 5	58 4	63 6	72 9	71.4	72 6	67.0	64 7	53 1	44.8	60 2
1896	50 2	54 1	55 4	53 3	60 0	71 5	76 5	72 0	68 0	65 4	52.6	49 4	60 7
1897	44 2	48 8	49 4	62 6	67 0	69 8	75 6	73 4	69 6	60 7	50 8	45 4	59.8
1898	42 0	51 8	51 9	61 4	59 9	69 6	74 2	73 8	68 8	63 4	53.4	44 2	59.5
1899	49 0	51 5	52 8	59 4	59 3	71 2	72 1	68 0	72 9	60 4	54.9	48 9	59 6
1900	47 2	51 7	57 3	56 7	64 5	69 4	73 6	70 2	67 0	60.8	55 2	45.2	59 9
Means for 48 years	47 5	51 2	55 0	58 5	62 7	70 3	73 1	70.3	69.8	61.8	54.5	45 4	60.0

## CLIMATOLOGY OF THE GREAT VALLEY.

99

## MAXIMUM AND MINIMUM TEMPERATURES.

Year.	Number of days maximum temperature 90° or above.						Number of days minimum temperature 35° or below.			Number of days minimum temperature 40° or below.		
	May.	June.	July.	Aug.	Sept.	Oct.	Dec.	Jan.	Feb.	Mar.	Apr.	Nov.
1877.....			22	18	13	0	12					3
1878.....	1	9	14	13	6	0	18	8	0	1	0	6
1879.....	1	11	13	18	11	0	12	17	2	1	0	13
1880.....	0	0	6	7	4	0	0	13	13	18	2	18
1881.....	0	3	11	5	7	0	8	1	0	8	0	13
1882.....	2	5	19	14	9	0	4	16	10	8	1	14
1883.....	3	12	16	17	10	0	15	18	15	0	2	14
1884.....	0	2	8	14	1	0	7	11	11	5	1	5
1885.....	4	3	11	20	13	4	0	1	0	0	1	2
1886.....	2	6	14	17	9	0	6	10	0	5	3	24
1887.....	3	10	14	10	11	4	11	10	0	0	0	11
1888.....	1	3	17	23	17	1	0	16	2	8	0	9
1889.....	4	8	14	21	11	2	1	11	6	0	0	5
1890.....	3	5	14	13	8	0	9	13	4	4	0	16
1891.....	0	6	23	23	8	2	14	9	7	1	1	11
1892.....	4	9	14	16	6	2	9	4	6	4	4	10
1893.....	0	5	15	16	0	0	5	6	8	8	3	10
1894.....	0	1	20	17	15	2	4	11	5	7	2	4
1895.....	2	12	8	15	6	0	12	5	0	6	0	6
1896.....	2	9	18	10	2	1	1	5	0	6	6	8
1897.....	1	9	20	14	8	0	16	5	2	10	0	15
1898.....	0	9	19	14	10	0	15	25	1	16	1	13
1899.....	1	11	13	3	20	2	8	4	7	6	0	18
1900.....	1	5	16	6	2	0	4	0	1	1	1	3

## SUMMARIES OF MONTHLY MEANS AND EXTREMES OF TEMPERATURE.

Month.	Highest month-ly mean.		Lowest month-ly mean.		Absolute maxi-mum.		Absolute mini-mum.		Greatest daily range.	Mean daily range.	Mean variability.	Mean of 3 consecutive warmest days.	Mean of 3 consecutive coldest days.
	Tem-perature.	Date.	Tem-perature.	Date.	Tem-perature.	Date.	Tem-perature.	Date.					
January.....	52.7	1873	41.8	1883	72.0	30, 1899	a 19.0	14-15, 1888	30.0	14.5	2.5	52.8	39.5
February.....	55.0	1877	45.7	1880	80.0	18, 1899	21.0	13, 1884	35.0	16.4	2.4	56.6	43.3
March.....	60.4	1885	49.2	1880	80.0	30, 1882	29.0	15, 1880	34.0	17.0	2.3	63.8	48.1
April.....	63.3	1857	53.3	1896	89.0	28, 1888	b 30.0	17, 1892	37.0	20.2	3.0	62.0	51.8
May.....	70.2	1865	58.5	1860	c 98.0	26, 1883	d 39.0	12, 1880	41.0	22.4	3.1	75.0	55.9
June.....	77.0	1853	64.8	1894	106.0	30, 1891	44.0	1, 1890	42.0	26.3	3.2	78.3	62.2
July.....	80.6	1854	69.1	1859	106.0	21, 1891	48.0	17, 1887	44.0	30.3	3.0	81.7	67.1
August.....	76.8	1888	66.3	1873	110.0	11, 1898	48.0	30, 1887	44.0	31.3	2.9	81.5	67.1
September.....	76.0	1853	65.0	1854	106.0	11, 1888	e 44.0	18, 1882	44.0	28.5	2.8	77.2	62.9
October.....	78.0	1853	57.6	1881	98.0	3, 1885	36.0	14, 1881	39.0	24.7	2.5	69.8	55.1
November.....	58.2	1894	49.3	1880	f 78.0	1, 1890	27.0	23, 1880	36.0	21.3	2.5	60.4	42.0
December.....	50.9	1861	43.2	1890	69.0	8-9, 1893	g 24.0	29, 1878	32.0	14.0	2.7	54.4	40.5
Annual.....	80.6	1854	41.8	1883	110.0	(h)	a 19.0	(i)	44.0	22.2	2.7	67.8	53.0

a Also January, 1854.

b Also April 15, 1896.

c Also May 23, 1885, and May 23, 1887.

d Also May 7, 1887, and May 9, 1896.

e Also September 12, 1893.

f Also November 4, 1892, and November 7, 1894.

g Also December 14, 1883.

h August 11, 1893.

i January 14-15, 1883.

CLIMATOLOGY OF CALIFORNIA.

WEATHER

Month	Average number of—				Month	Average number of—			
	Clear days	Partly cloudy days	Cloudy days	Rainy days		Clear days	Partly cloudy days	Cloudy days	Rainy days
January . . . . .	12	8	11	9	August . . . . .	29	2	0	0
February . . . . .	12	9	7	8	September . . . . .	25	4	1	2
March . . . . .	14	9	8	5	October . . . . .	22	7	2	3
April . . . . .	15	10	5	6	November . . . . .	18	7	5	6
May . . . . .	19	8	4	4	December . . . . .	11	9	11	9
June . . . . .	23	5	2	1	Annual . . . . .	229	80	56	53
July . . . . .	29	2	0	0					

DATES OF FIRST AND LAST LIGHT AND KILLING FROSTS, WITH LOWEST TEMPERATURE AND SNOWFALL, AND DATES OF BLOOMING FRUIT TREES, FROM 1869 TO 1901

[From the records of Mr Samuel H Gerrish, voluntary observer of the Weather Bureau]

Year	First light frost of season		First killing frost of season		Last light frost of season		Last killing frost of season		First appearance of blossoming fruit trees
	Date	Minimum temperature	Date	Minimum temperature	Date.	Minimum temperature.	Date	Minimum temperature	
		°F.		°F.		°F.		°F.	
1869-70 . . . . .	Nov 8, 1869	40 0	Nov 30, 1869	31 0	May 17, 1870	41 0	Mar 8, 1870	31 0	Feb 21, 1870
1870-71 . . . . .	Oct 24, 1870	36 0	Oct 27, 1870	30 0	Apr 19, 1871	40 0	Mar 18, 1871	31 0	Feb 8, 1871
1871-72 . . . . .	Oct 25, 1871	37 0	Nov 6, 1871	30 0	Apr 12, 1872	38 0	Jan 9, 1872	27 0	Feb. 26, 1872
1872-73 . . . . .	Oct 22, 1872	37 0	Nov 10, 1872	27 0	Apr 6, 1873	34 0	Apr 5, 1873	27 0	Feb. 16, 1873
1873-74 . . . . .	Oct 16, 1873	33 0	Oct 17, 1873	31 0	Apr 11, 1874	38 0	Mar 19, 1874	28 0	Feb 14, 1874
1874-75 . . . . .	Oct 29, 1874	39 0	Nov 20, 1874	29 0	Apr 7, 1875	31 0	Apr 6, 1875	24 0	Feb 21, 1875
1875-76 . . . . .	Oct 28, 1875	38 0	(b)	35 0	Apr 8, 1876	38 0	Jan 16, 1876	29 0	Feb. 20, 1876
1876-77 . . . . .	Nov 3, 1876	36 0	Nov 13, 1876	29 0	Apr 23, 1877	42 0	Feb 11, 1877	32 0	Feb 2, 1877
1877-78 . . . . .	Oct 31, 1877	33 0	Nov 1, 1877	31 0	Mar. 9, 1878	39 0	Jan 12, 1878	30 0	Feb 1, 1878
1878-79 . . . . .	Oct 18, 1878	37 0	Oct 28, 1878	29 0	Apr. 15, 1879	41 0	Feb 6, 1879	27 0	Feb 15, 1879
1879-80 . . . . .	Nov 8, 1879	39 0	Nov 27, 1879	25 0	Apr 18, 1880	37 0	Mar. 30, 1880	28 0	Feb. 29, 1880
1880-81 . . . . .	Oct 31, 1880	35 0	Nov 13, 1880	28 0	Mar 18, 1881	33 0	Mar 17, 1881	31 0	Feb 22, 1881
1881-82 . . . . .	Oct 4, 1881	36 0	Nov 11, 1881	30 0	May 15, 1882	41 0	Mar 9, 1882	29 0	Feb 28, 1882
1882-83 . . . . .	Oct 5, 1882	42 0	Nov 13, 1882	27 0	May 2, 1883	41 0	Feb 18, 1883	29 0	Feb 19, 1883
1883-84 . . . . .	Oct 16, 1883	39 0	Nov 4, 1883	31 0	Apr 17, 1884	43 0	Feb 18, 1884	31 0	Feb. 20, 1884
1884-85 . . . . .	Sept 30, 1884	41 0	Nov 30, 1884	31 0	Apr 22, 1885	41 0	Jan 26, 1885	31 0	Feb 10, 1885
1885-86 . . . . .	Oct 11, 1885	38 0	(c)	34 0	Apr 14, 1886	39 0	Jan 10, 1886	27 0	Feb 8, 1886
1886-87 . . . . .	Oct 9, 1886	40 0	Nov 4, 1886	32 0	May 10, 1887	34 0	Feb 26, 1887	26 0	Jan 28, 1887
1887-88 . . . . .	Oct 20, 1887	37 0	Nov 25, 1887	28 0	Apr 26, 1888	38 0	Feb 3, 1888	28 0	Feb 20, 1888
1888-89 . . . . .	Oct 19, 1888	37 0	Nov 6, 1888	28 0	Mar 19, 1889	34 0	Feb 19, 1889	26 0	Feb 3, 1889
1889-90 . . . . .	Oct 29, 1889	36 0	Dec 29, 1889	27 0	Apr 14, 1890	35 0	Feb 28, 1890	25 0	Feb 13, 1890
1890-91 . . . . .	Oct 11, 1890	34 0	Nov 7, 1890	28 0	Mar 30, 1891	34 0	Feb. 25, 1891	26 0	Feb. 17, 1891
1891-92 . . . . .	Oct 29, 1891	36 0	Nov 14, 1891	30 0	May 11, 1892	31 0	Apr 26, 1892	32 0	Feb. 16, 1892
1892-93 . . . . .	Oct 18, 1892	36 0	Nov 16, 1892	29 0	Apr 12, 1893	33 0	Mar 13, 1893	28 0	Feb 16, 1893
1893-94 . . . . .	Oct 11, 1893	34 0	Nov 3, 1893	28 0	May 16, 1894	37 0	Mar. 4, 1894	30 0	Feb. 12, 1894
1894-95 . . . . .	Oct 28, 1894	39 0	Dec 25, 1894	31 0	Apr 12, 1895	41 0	Feb 5, 1895	33 0	Feb 13, 1895
1895-96 . . . . .	Nov 4, 1895	36 0	Nov 24, 1895	30 0	May 17, 1896	41 0	Mar 4, 1896	32 0	Feb 1, 1896
1896-97 . . . . .	Oct 13, 1896	41 0	Nov 26, 1896	32 0	Apr 2, 1897	39 0	Feb 23, 1897	30 0	Feb. 16, 1897
1897-98 . . . . .	Oct 15, 1897	41 0	Nov 8, 1897	32 0	Apr 7, 1898	39 0	Mar 26, 1898	30 0	Feb. 16, 1898
1898-99 . . . . .	Oct 1, 1898	40 0	Nov 23, 1898	32 0	May 18, 1899	42 0	Feb 9, 1899	30 0	Feb. 14, 1899
1899-1900 . . . . .	Oct 15, 1899	38 0	(d)	34 0	Apr 13, 1900	40 0	(e)	34 0	Feb. 8, 1900
1900-1901 . . . . .	Oct 29, 1900	41 0	Dec 28, 1900	32 0	Apr 10, 1901	40 0	Apr. 4, 1901	33 0	Feb 10, 1901

a Coldest ever known  
b No killing frost, coldest on December 21, 1875  
c No killing frost, coldest on December 28, 1885  
d No killing frost, coldest December 19, 1899  
e No killing frost, coldest February 8, 1900

Dates of snowfall in Sacramento, and the amount precipitated.—January 29, 1862, 0.75 of an inch. January 12, 1868, 1.62 inches. December 3, 1873, 6 inches. April 5, 1875, a trace, enough to whiten the ground before it melted. This was the coldest April ever known. A very light trace on January 13, 1879. January 26, 1880, estimated about 0.25 of an inch, it mostly melted as it fell. February 17 and 18, 1882, trace. December 31, 1882, estimated about 4 inches, measured 1.50 inches actual measurement. February 1 and 6, 1883, a very light fall of snow. January 4, 1888, 2.89 inches. January 5, 1888, 3 inches. The snow that fell on the 5th was very damp, and packed hard, if it had been as light as that on the 4th, I think we would have had over 6 inches. January 16, 1888, a trace. January 12 and 21, 1890, a few flakes of snow, melting as fast as they fell. March 2, 1896, during the rain the air was filled with large flakes of snow for ten minutes, which melted as it fell. A few flakes of snow fell February 2, 1899. Mr. Gerrish states that the frost of April 4, 1901, did more damage than the frost on February 11, 1901, when the temperature fell to 32°.



## MONTHLY, ANNUAL, AND SEASONAL PRECIPITATION (INCHES AND HUNDREDTHS).

[From Dr. T. M. Logan, Dr. F. W. Hatch, and Weather Bureau Records.]

Year.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Season of—	Seasonal.	An- nual.
1849.....									0.25	1.50	2.25	12.50			
1850.....	4.50	0.50	10.00	4.25	0.25						T.	T.	1849-50	36.00	19.50
1851.....	0.65	0.35	1.88	1.14	0.69				1.00	0.18	2.14	7.07	1850-51	4.71	15.10
1852.....	0.58	0.12	6.40	0.19	0.30				T.		6.00	13.40	1851-52	17.98	26.99
1853.....	3.00	2.00	7.00	3.50	1.45	T.	T.		T.	T.	1.50	1.54	1852-53	36.35	19.99
1854.....	3.25	8.50	3.25	1.50	0.21	0.31		T.	T.	1.01	0.65	1.15	1853-54	20.06	19.83
1855.....	2.67	3.46	4.20	4.32	1.15	0.01			T.		0.75	2.00	1854-55	18.62	18.56
1856.....	4.92	0.69	1.40	2.13	1.84	0.03			T.	0.20	0.65	2.40	1855-56	13.78	14.26
1857.....	1.38	4.80	0.68	T.	T.	0.35		T.		0.66	2.41	2.63	1856-57	10.46	12.91
1858.....	2.44	2.46	2.88	1.21	0.20	0.10	0.01	T.	T.	3.01	0.15	4.34	1857-58	14.99	16.80
1859.....	0.96	3.91	1.64	0.98	1.04				0.02		6.48	1.83	1858-59	16.04	16.86
1860.....	2.31	0.93	5.11	2.87	2.49	0.02	0.63		0.06	0.91	0.18	4.28	1859-60	22.06	19.79
1861.....	2.67	2.92	3.82	0.48	0.59	0.14	0.55			T.	2.17	8.64	1860-61	16.18	21.48
1862.....	15.04	4.26	2.80	0.82	1.81	0.01		0.01		0.86	T.	2.33	1861-62	36.10	27.44
1863.....	1.73	2.75	2.36	1.69	0.36				T.		1.49	1.82	1862-63	11.59	12.20
1864.....	1.08	0.19	1.30	1.08	0.74	0.09		0.08	T.	0.12	6.72	7.87	1863-64	7.79	19.27
1865.....	4.78	0.71	0.48	1.37	0.46		T.		0.08	0.48	2.43	0.36	1864-65	22.59	11.15
1866.....	7.70	2.01	2.02	0.48	2.25	0.10	0.02			T.	2.43	9.51	1865-66	17.91	26.52
1867.....	3.44	7.10	1.01	1.80	0.01				0.01		3.81	12.85	1866-67	25.32	30.03
1868.....	6.04	3.15	4.35	2.31	0.27	T.					0.77	2.61	1867-68	32.79	19.50
1869.....	4.79	3.63	2.94	1.24	0.65	0.01			T.	2.12	0.85	1.96	1868-69	16.64	18.19
1870.....	1.37	3.24	1.64	2.12	0.27	T.	T.	T.		0.02	0.58	0.97	1869-70	13.57	10.21
1871.....	2.08	1.92	0.09	1.45	0.76	T.			T.	0.21	1.22	10.59	1870-71	8.47	18.92
1872.....	4.04	4.74	1.94	0.61	0.28	0.02			T.	0.22	1.93	5.39	1871-72	23.65	19.17
1873.....	1.23	4.36	0.55	0.51		T.	0.02	T.		0.31	1.21	10.01	1872-73	14.19	18.20
1874.....	5.20	1.86	3.05	0.89	0.37	T.	T.		0.05	2.26	3.80	0.44	1873-74	22.92	17.92
1875.....	8.70	0.55	0.80	T.	T.	1.10				0.44	6.20	5.52	1874-75	17.70	23.31
1876.....	4.99	3.75	4.15	1.10	0.15		0.21	0.02	T.	3.45	0.30		1875-76	26.30	18.12
1877.....	2.77	1.04	0.56	0.19	0.64	0.01	T.	T.		0.73	1.07	1.43	1876-77	9.19	8.44
1878.....	9.26	8.04	3.09	1.07	0.17				0.29	0.55	0.51	0.47	1877-78	24.86	23.45
1879.....	3.18	3.88	4.88	2.66	1.80	0.13	T.	T.		0.88	2.05	3.41	1878-79	17.85	22.37
1880.....	1.64	1.83	1.70	14.20	0.76		T.				0.05	11.81	1879-80	26.47	31.99
1881.....	6.14	5.06	1.37	1.64	T.	0.50	T.		0.30	0.55	1.88	3.27	1880-81	26.57	20.71
1882.....	1.89	2.40	3.78	1.99	0.85	0.10	T.		0.57	2.63	1.13		1881-82	16.51	18.06
1883.....	2.23	1.11	3.70	0.67	2.85				0.90	0.97	0.61	0.44	1882-83	18.11	13.48
1884.....	3.43	4.46	8.14	4.32	0.06	1.45		T.	0.60	2.01		10.45	1883-84	24.78	34.92
1885.....	2.16	0.49	0.08	0.68	T.	0.11	T.		0.08	0.02	11.34	5.76	1884-85	16.58	20.72
1886.....	7.95	0.29	2.68	4.08	0.07					0.68	0.21	2.21	1885-86	32.27	18.17
1887.....	1.12	6.28	0.94	2.53	T.			T.	0.02		0.45	2.09	1886-87	13.97	13.43
1888.....	4.81	0.57	3.04	0.10	0.40	0.08	T.	T.	0.55		4.23	4.63	1887-88	11.56	18.46
1889.....	0.15	0.33	6.25	0.26	3.25	0.25				6.02	3.15	7.82	1888-89	19.95	27.48
1890.....	6.62	4.06	3.00	1.33	1.80			T.	0.30	T.			1889-90	33.30	20.95
1891.....	0.53	6.01	1.78	2.04	0.66	0.05	T.		0.10	0.10	0.48	3.28	1890-91	15.81	15.63
1892.....	1.78	2.84	3.02	1.20	2.38	T.			0.18	0.70	6.60	4.90	1891-92	15.13	23.60
1893.....	3.27	2.66	3.51	1.08	1.05		T.	T.	0.22	0.12	2.92	1.76	1892-93	23.95	16.59
1894.....	4.17	3.92	0.74	0.34	1.70	0.40	T.	T.	0.88	1.06	0.48	8.86	1893-94	16.35	22.61
1895.....	8.42	1.84	1.20	0.86	0.51		0.04	T.	1.26	0.17	1.54	1.54	1894-95	24.11	17.38
1896.....	9.76	0.09	2.57	5.34	0.92		T.	0.20	0.31	0.55	3.56	1.76	1895-96	23.23	25.06
1897.....	3.66	4.15	2.54	0.25	0.30	0.04		0.01	0.16	1.96	0.61	1.64	1896-97	17.32	15.32
1898.....	0.98	3.19	0.04	0.28	1.50	0.14			0.36	0.64	0.61	2.30	1897-98	10.51	10.04
1899.....	3.94	0.04	6.02	0.10	0.54	0.49	0	0.02	0	4.46	2.62	2.91	1898-99	15.04	21.14
1900.....	3.54	0.32	1.61	1.88	2.88	T.	T.	0	0.06	1.74	4.50	1.38	1899-1900	20.24	17.91
1901.....	3.70	5.32	0.48	2.23	0.80	T.	0	T.	0	1.67	2.02	2.91	1900-1901	20.21	17.88
Averages for 52 years..	3.82	2.80	2.78	1.76	0.84	0.12									19.41

a Average for fifty-one years.

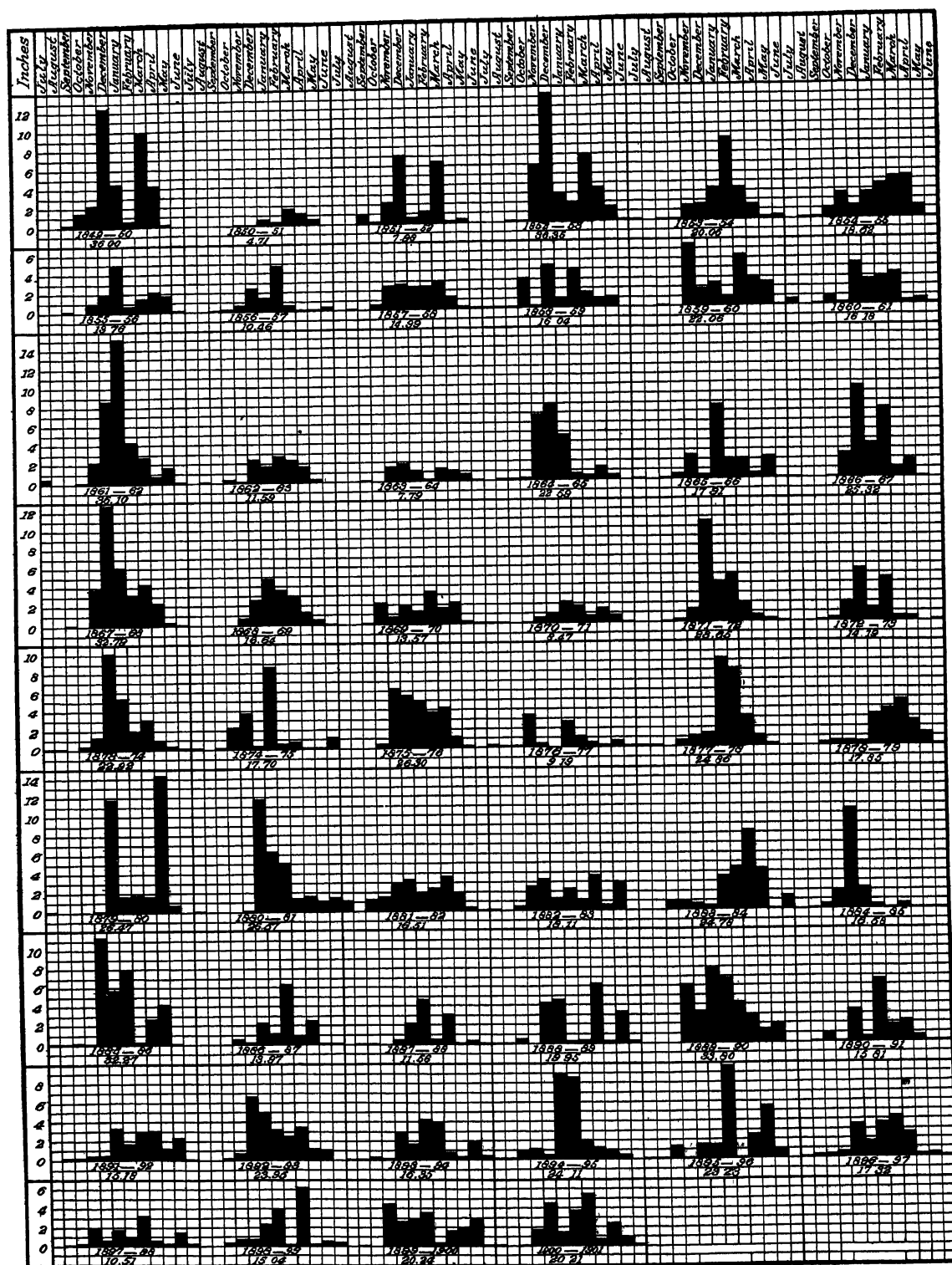


FIG. 11.—Seasonal rainfall at Sacramento, Cal., from 1849 to 1901.

## GREATEST PRECIPITATION (INCHES AND HUNDREDTHS) IN TWENTY-FOUR HOURS.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Greatest Annual.
1877.....							T.	T.	0.00	0.58	0.81	0.62	.....
1878.....	1.63	1.01	0.79	0.65	0.11	0.00	0.00	0.00	0.13	0.55	0.32	0.35	1.63
1879.....	0.77	1.40	1.97	0.71	0.72	0.13	T.	T.	0.00	0.55	0.41	1.47	1.97
1880.....	1.25	1.02	0.49	7.24	0.65	0.00	T.	0.00	0.00	0.00	0.05	1.96	7.24
1881.....	2.66	1.72	0.46	0.76	T.	0.45	T.	0.00	0.30	0.25	1.10	1.41	2.66
1882.....	0.57	0.65	1.30	0.60	0.35	0.10	T.	0.00	0.31	1.82	1.16	0.40	1.82
1883.....	1.90	0.98	1.61	0.32	1.15	0.00	0.00	0.00	0.77	0.80	0.55	0.25	1.90
1884.....	1.00	1.36	2.94	1.37	0.03	0.82	0.00	T.	0.30	1.70	0.00	2.44	2.94
1885.....	1.10	0.28	0.07	0.51	T.	0.10	T.	0.00	0.08	0.01	4.29	2.81	4.29
1886.....	2.50	0.20	1.15	1.15	0.06	0.00	0.00	0.00	0.00	0.43	0.21	0.84	2.50
1887.....	0.90	2.48	0.65	1.47	T.	0.00	0.00	T.	0.02	0.00	0.28	0.88	2.48
1888.....	1.90	0.20	0.90	0.09	0.36	0.04	T.	T.	0.43	0.00	2.12	1.10	2.12
1889.....	0.08	0.20	2.57	0.14	1.94	0.25	0.00	0.00	0.00	1.86	0.96	0.98	2.57
1890.....	1.40	1.80	0.81	0.94	0.82	0.00	0.00	T.	0.80	T.	0.00	2.35	2.35
1891.....	0.38	2.14	0.96	0.70	0.52	0.05	T.	0.00	0.06	0.06	0.26	0.86	2.14
1892.....	1.00	1.10	0.94	0.54	1.16	T.	0.00	0.00	0.14	0.32	3.26	1.86	3.26
1893.....	1.06	0.92	1.18	0.80	0.78	0.00	T.	T.	0.16	0.12	1.04	0.76	1.18
1894.....	2.25	2.20	0.32	0.20	0.72	0.38	T.	T.	0.88	0.40	0.48	1.32	2.25
1895.....	2.66	1.34	0.42	0.60	0.16	0.00	0.04	T.	0.73	0.14	0.52	0.47	2.66
1896.....	1.84	0.08	0.84	2.18	0.56	0.00	T.	0.20	0.24	0.45	1.60	0.54	2.18
1897.....	1.36	1.25	1.20	0.14	0.30	0.04	0.00	0.01	0.16	1.18	0.28	1.04	1.36
1898.....	0.40	1.12	0.04	0.24	1.00	0.14	0.00	0.00	0.36	0.34	0.50	1.00	1.12
1899.....	1.10	0.04	2.20	0.09	0.44	0.45	0.00	0.02	0.00	2.08	0.62	1.00	2.20
1900.....	1.52	0.16	0.80	0.90	1.60	T.	T.	0.00	0.06	0.60	2.82	0.54	2.82
Greatest.....	2.66	2.48	2.94	7.24	1.94	0.82	0.04	0.20	0.88	1.86	4.29	2.96	7.24
Date.....	{ 29, 1881 } { 3-4, 1895 }		4-5	8-9	21	5	11-12	4	30	29	21-22	17-18	2 April 21
Year.....	1881-95	1887	1884	1880	1889	1884	1895	1896	1894	1889	1886	1880	1880

## DATES WHEN PRECIPITATION EQUALED OR EXCEEDED 2.50 INCHES IN ANY CONSECUTIVE TWENTY-FOUR HOURS.

	Inches.
April 19, and 20, 1880, from 8.02 p. m. 19 to 8.02 p. m. 20.....	5.28
April 20 and 21, 1880, from 8.02 p. m. 20 to 9.55 a. m. 21.....	3.09
December 1 and 2, 1880, from 12.02 p. m. 1 to 12.02 p. m. 2.....	2.58
January 28 and 29, 1881, from 8.02 p. m. 28 to 8.02 p. m. 29.....	2.66
March 8 and 9, 1884, from 3 p. m. 8 to 7 a. m. 9.....	2.94
November 17 and 18, 1885, from 8.30 a. m. 17 to 7 a. m. 18.....	4.29
December 21, 1885, from 4 a. m. 21 to 2.55 p. m. 21.....	2.81
January 23, 1886, from 8.30 a. m. 23 to 11 p. m. 23.....	2.50
March 12 and 13, 1889, from 4 p. m. 12 to 9 a. m. 13.....	2.57
November 29 and 30, 1892, from 10 p. m. 29 to 8 p. m. 30.....	3.26
January 3 and 4, 1895, from 6.20 p. m. 3 to 6.20 p. m. 4.....	2.66

## MONTHLY EXTREMES OF PRECIPITATION.

Month.	Greatest monthly precipitation.		Least monthly precipitation.		Number of times monthly precipitation has exceeded normal in 50 years.		Total.	Month.	Greatest monthly precipitation.		Least monthly precipitation.		Number of times monthly precipitation has exceeded normal in 50 years.		Total.
	Amount.	Date.	Amount.	Date.	In first 25 years.	In second 25 years.			Amount.	Date.	Amount.	Date.	In first 25 years.	In second 25 years.	
January.....	Inches. 15.04	1862	Inches. 0.15	1889	9	11	20	July.....	Inches. 0.63	1860	Inches. 0.00	(a)	2	2	4
February.....	8.50	1854	0.04	1899	12	11	23	August.....	0.20	1896	0.00	(a)	1	2	8
March.....	10.00	1860	0.04	1898	11	12	23	September.....	1.26	1895	0.00	.....	2	12	14
April.....	14.20	1880	T.	{ 1857 } { 1875 }	8	8	16	October.....	6.02	1889	0.00	.....	6	8	14
May.....	3.25	1889	0.00	(a)	7	9	16	November.....	11.34	1885	0.00	{ 1884 } { 1890 }	11	8	19
June.....	1.45	1884	0.00	(a)	8	8	11	December.....	13.40	1852	0.00	1876	10	8	18

a Many years.

CLIMATOLOGY OF CALIFORNIA.

AVERAGE HOURLY WIND VELOCITY (MILES PER HOUR)

[Record began July 1, 1877, to December 31, 1900]

Hour	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1. . . . . A M . . . . .	67	70	72	73	80	96	81	74	68	59	55	62
2. . . . .	67	70	72	70	74	79	76	72	63	56	56	63
3. . . . .	66	69	72	68	72	77	77	74	64	56	56	64
4. . . . .	66	71	72	67	72	76	78	74	66	57	56	65
5. . . . .	65	71	71	70	72	76	78	75	65	58	55	65
6. . . . .	65	71	71	68	72	73	74	72	63	54	53	65
7. . . . .	64	70	71	67	73	73	71	69	60	55	52	63
8. . . . .	64	69	71	66	71	70	68	64	57	54	52	63
9. . . . .	64	66	68	63	68	68	65	60	56	53	52	64
10. . . . .	64	66	70	64	70	71	65	56	54	51	51	65
11. . . . .	65	67	70	72	77	73	66	55	55	51	51	64
12 (noon) . . . . .	67	71	79	81	83	75	66	54	58	55	53	67
1. . . . . P M . . . . .	71	77	88	85	87	79	67	56	62	61	58	71
2. . . . .	71	82	90	91	90	82	69	58	66	65	63	72
3. . . . .	81	88	94	96	94	82	72	61	68	69	66	78
4. . . . .	82	90	97	97	97	88	74	62	69	72	68	79
5. . . . .	81	90	98	97	99	93	79	67	70	71	69	78
6. . . . .	80	90	96	97	101	98	85	72	71	69	66	75
7. . . . .	78	86	94	96	104	103	89	76	71	67	60	70
8. . . . .	70	77	89	92	102	104	92	79	69	57	50	62
9. . . . .	64	70	81	87	90	105	93	80	67	54	49	61
10. . . . .	64	67	74	68	93	102	90	79	67	58	51	62
11. . . . .	65	68	73	79	88	98	91	80	70	60	52	62
12 (midnight) . . . . .	66	69	75	76	85	93	84	78	72	60	55	62
Average. . . . .	63	78	77	92	80	90	83	89	75	72	66	68

NUMBER OF DAYS WITH PRECIPITATION, FROM JULY 1, 1877, TO DECEMBER 31, 1900

Month	Less than 0 01 inch	0 01 to 0 10 inch	0 11 to 0 25 inch	0 26 to 0 50 inch	0 51 to 1 inch	Over 1 inch.
January . . . . .	39	78	43	34	37	25
February . . . . .	33	62	35	30	30	17
March . . . . .	47	90	46	40	30	11
April . . . . .	41	59	32	30	20	6
May . . . . .	38	36	22	17	10	3
June . . . . .	22	18	4	4	1	0
July . . . . .	16	1	0	0	0	0
August. . . . .	13	2	1	0	0	0
September . . . . .	19	12	12	8	3	0
October. . . . .	27	34	20	18	7	8
November . . . . .	23	47	27	28	19	11
December . . . . .	35	82	51	36	48	19
Total . . . . .	373	521	293	245	205	100

NUMBER OF CLEAR, PARTLY CLOUDY, CLOUDY, RAINY, AND FOGGY DAYS, AND TOTAL NUMBER OF THUNDERSTORMS AND AURORAS FROM JULY 1, 1877, TO DECEMBER 31, 1900

Month	Clear	Partly cloudy	Cloudy	Rainy days, 0 01 or more	Foggy days	Total number thunderstorms	Total number auroras	Month	Clear	Partly cloudy	Cloudy	Rainy days, 0 01 or more	Foggy days	Total number thunderstorms	Total number auroras.
January . . . . .	260	195	247	217	131	2	0	September . . . . .	599	88	83	35	1	12	0
February . . . . .	275	219	156	176	43	3	0	October . . . . .	514	186	64	80	15	3	0
March . . . . .	311	218	184	116	14	9	0	November . . . . .	419	160	141	134	53	3	0
April . . . . .	348	228	114	147	3	10	0	December . . . . .	253	215	276	223	153	2	0
May . . . . .	441	182	90	88	0	16	0	Sums . . . . .	5,340	1,895	1,359	1,246	414	74	(a)
June . . . . .	548	107	35	26	1	6	0	Annual average	229	80	56	53	18	3	....
July . . . . .	698	40	6	1	0	3	0								
August . . . . .	674	57	13	3	0	5	0								

aTwo in November, 1882

## CLIMATOLOGY OF THE GREAT VALLEY.

105

## NUMBER OF HIGH WINDS FROM JULY 1, 1877, TO DECEMBER 31, 1900.

Velocity.				Velocity.				Velocity.			
Month.	25 to 30 miles.	31 to 40 miles.	Over 40 miles.	Month.	25 to 30 miles.	31 to 40 miles.	Over 40 miles.	Month.	25 to 30 miles.	31 to 40 miles.	Over 40 miles.
January .....	6	11	7	June.....	10	5	1	November.....	8	8	4
February.....	5	15	1	July .....	6	0	0	December .....	12	11	5
March .....	8	9	5	August .....	3	0	0	Total .....	96	94	27
April .....	8	14	1	September.....	8	4	0				
May .....	11	9	2	October.....	11	8	1				

## HIGHEST WIND VELOCITY, DIRECTION, AND DATE FROM JULY 1, 1877, TO APRIL 30, 1901.

	Velocity.	Direction.	Day and year.		Velocity.	Direction.	Day and year.
January .....	60	SE.	3, 1901	July .....	30	NW.	1, 1882
February .....	48	NW.	10, 1894	August .....	28	SW.	<sup>b</sup> 5, 1896
March .....	48	SE.	<sup>a</sup> 29, 1892	September .....	36	NW.	<sup>c</sup> 23, 1889
April .....	40	NW.	8, 1900	October .....	48	S.	20, 1894
May .....	44	NW.	9, 1895	November .....	51	SE.	21, 1900
June .....	42	NW.	12, 1886	December .....	60	SE.	9, 1894

<sup>a</sup> Also on March 4, 1888, from the SE., and March 2, 1896, from the S.<sup>b</sup> Also on August 20, 1899, from the SW.<sup>c</sup> Also on September 21, 1895, from the NW., and September 20, 1900, from the NW.

## GREATEST PRECIPITATION IN THE SHORTEST PERIODS OF TIME FROM JULY, 1877, TO APRIL, 1901.

Date.	Duration.	Inches.	Average inch per hour.	Date.	Duration.	Inches.	Average inch per hour.
	<i>h. m.</i>				<i>h. m.</i>		
January 15, 1878 .....	14 20	1.63	0.11	April 21, 1880 .....	22 00	7.24	0.33
January 22, 1878 .....	2 08	1.54	0.72	April 24, 1896 .....	12 00	1.60	0.13
January 29, 1881 .....	8 00	1.29	0.16	April 29, 1901 .....	12 00	1.45	0.12
January 29, 1881 .....	24 00	2.66	0.11	May 5, 1889 .....	12 00	1.14	0.10
January 23, 1886 .....	8 00	1.77	0.22	May 5, 1900 .....	11 00	1.32	0.12
January 23, 1886 .....	15 40	2.58	0.17	October 3, 1882 .....	8 00	1.10	0.14
January 3, 1888 .....	8 00	1.40	0.18	October 3, 1882 .....	16 30	1.82	0.11
January 3, 1888 .....	12 30	1.86	0.15	October 21, 1899 .....	12 00	1.48	0.12
January 15, 1894 .....	12 00	1.52	0.13	October 21, 1899 .....	23 15	2.08	0.09
January 15, 1894 .....	21 45	2.25	0.10	October 21, 1899 .....	4 30	1.67	0.37
January 4, 1895 .....	10 20	1.26	0.12	November 17, 1885 .....	6 30	1.35	0.21
January 4, 1895 .....	24 00	2.66	0.11	November 17, 1885 .....	7 00	1.27	0.18
January 20, 1896 .....	12 00	1.44	0.12	November 17, 1885 .....	18 00	4.29	0.24
January 20, 1896 .....	18 25	1.84	0.10	November 16, 1888 .....	12 00	1.65	0.14
February 5, 1887 .....	16 00	1.85	0.12	November 16, 1888 .....	24 00	1.95	0.08
February 5, 1887 .....	32 00	3.46	0.11	November 30, 1892 .....	7 45	2.26	0.29
February 23, 1891 .....	7 40	1.20	0.16	November 21, 1900 .....	12 00	1.60	0.13
February 19, 1894 .....	9 00	1.83	0.20	November 21, 1900 .....	21 00	2.32	0.11
February 13, 1899 .....	16 30	2.16	0.13	December 2, 1880 .....	8 00	1.21	0.15
February 5, 1901 .....	11 45	1.42	0.12	December 2, 1880 .....	24 00	2.58	0.11
March 5, 1879 .....	8 00	1.00	0.13	December 4, 1881 .....	8 00	1.16	0.15
March 9, 1884 .....	8 00	2.14	0.27	December 23, 1884 .....	8 00	1.31	0.16
March 13, 1889 .....	12 00	2.21	0.18	December 25, 1884 .....	6 00	1.87	0.31
March 15, 1899 .....	11 30	1.70	0.15	December 21, 1885 .....	11 00	2.81	0.26
March 15, 1899 .....	2 00	1.99	1.00	December 24, 1885 .....	6 00	1.40	0.23
April 20, 1880 .....	8 00	4.15	0.52	December 24, 1885 .....	9 00	1.85	0.21
April 20, 1880 .....	8 00	2.20	0.28	December 3, 1890 .....	13 00	2.00	0.15
April 20, 1880 .....	16 00	6.35	0.40				

By Mr J. P. BOLTON, Observer, Weather Bureau

During the period from October to May, comprising the wet season, Fresno County is favored with well-distributed rains at irregular intervals, aggregating for the season an average of about 10.12 inches. The greatest number of consecutive days with rain was eight, in January, 1895, the greatest amount recorded in any twenty-four consecutive hours being 2.10 inches—December 29 to 30, 1891.

A dry season prevails over this section during the period from May to September.

The highest temperature ever recorded at Fresno was 114°, on July 1, 1891; the lowest was 20° above zero, on January 17, 1888.

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual.
1888	44 1	53 2	54 1	67 1	68 6	74 1	80 6	86 3	88 4	68 9	56 0	48 6	65 4
1889	43 6	50 5	58 4	63 5	69 6	79 5	82 6	82 2	75 6	62 8	54 1	49 1	64 3
1890	42 3	41 2	54 6	61 2	69 4	73 4	82.5	80 8	74 6	64 5	56 9	43 8	62 6
1891	45 4	48 5	54 4	59 0	67 1	73 0	83 6	88 6	74 6	67 0	56 2	43 9	63 0
1892	48.5	53 2	55 6	57 6	67 2	72 8	79 4	81 4	73 6	63 9	56 4	47 4	63 1
1893	42 8	43 4	52 2	55 9	66 9	73 2	80 8	82 0	68 4	60 8	52 8	48 4	61 0
1894	43 8	46 8	53 0	62 2	67 6	68 9	82 7	82 1	74.0	64 0	58 6	47 6	62 6
1895	45 3	52 6	53 7	60 0	67 4	77 2	79 4	80 6	70 4	66 6	52 8	43 6	62 5
1896	50 6	53 4	56 3	54 7	63.9	78 6	85 0	79 8	72 6	66 7	53 2	49 5	63 7
1897	43 7	49 2	48 6	63 5	71 7	74 3	82 8	81 8	72 8	61 2	52 0	45 1	62 3
1898	41.7	53 8	52 8	65 4	65 2	72 2	83 9	81 6	72 8	64 6	52 5	45 2	63 1
1899	50 0	51 2	54 4	61 1	63 2	78 3	81 8	75 1	77 3	60 4	54 4	43 8	62 6
1900	46 7	51 4	59 2	58 3	68 4	77 3	82.4	75 2	69 5	62.6	57 5	45 2	62 6
Means	45 3	50 2	54 4	60 8	67 4	74 1	82 1	81 0	73 8	64 2	54 6	47 0	63 0

[illegible]

## DATES OF FROST.

Year.	Last light frost.	Last kill- ing frost.	First light frost.	First kill- ing frost.	Year.	Last light frost.	Last kill- ing frost.	First light frost.	First kill- ing frost.
1888.....	Mar. 6	Mar. 1	Nov. 7	.....	1895.....	Mar. 21	Apr. 5	Nov. 22	Nov. 23
1889.....	Feb. 20	Feb. 19	Nov. 6	Dec. 21	1896.....	Apr. 15	Mar. 1	Nov. 26	Nov. 29
1890.....	Mar. 27	Apr. 14	Nov. 9	Dec. 6	1897.....	Mar. 23	Mar. 30	Nov. 16	Nov. 26
1891.....	Apr. 8	Mar. 29	Oct. 2	Dec. 3	1898.....	Mar. 27	Mar. 22	Nov. 7	Nov. 21
1892.....	Apr. 18	Mar. 28	Nov. 15	Nov. 25	1899.....	Apr. 29	Feb. 7	Dec. 10	.....
1893.....	Apr. 13	Mar. 13	Nov. 16	Nov. 18	1900.....	Apr. 9	Feb. 8	Oct. 30	Dec. 28
1894.....	Apr. 17	Mar. 4	Dec. 14	Dec. 2					

## MONTHLY, ANNUAL AND SEASONAL PRECIPITATION (INCHES AND HUNDREDTHS).

[An accurate record of rainfall was kept by Louis Enstein from August, 1881, to August, 1887; measurements were made with a standard rain gauge. Weather Bureau records began in August, 1887.]

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	An- nual.	Seasonal.
1882.....	0.54	1.44	1.80	1.36	0.21	0.00	0.00	0.00	0.56	1.07	1.00	0.42	7.89	1881-82 6.91
1883.....	0.54	0.27	3.28	1.01	1.69	0.00	0.00	0.00	0.05	1.17	0.17	0.56	8.69	1882-83 9.38
1884.....	2.54	4.35	3.77	3.42	1.43	1.25	0.00	0.00	0.00	0.46	0.08	3.93	21.23	1883-84 13.90
1885.....	0.63	0.00	0.76	1.32	0.02	T.	0.00	0.00	0.00	0.11	9.54	2.06	14.44	1884-85 7.20
1886.....	2.82	0.68	1.34	2.87	0.03	0.00	0.00	0.00	0.00	0.57	0.80	0.44	9.55	1885-86 19.45
1887.....	0.40	3.09	0.17	2.93	0.03	0.04	0.00	0.00	0.49	0.15	0.32	1.16	8.78	1886-87 8.47
1888.....	1.75	0.13	1.95	0.22	0.56	T.	T.	T.	0.06	0.00	2.38	1.71	8.76	1887-88 6.73
1889.....	0.34	0.32	2.07	0.54	0.57	0.00	0.00	T.	0.00	3.17	1.39	3.87	12.27	1888-89 7.99
1890.....	2.12	0.80	1.04	0.17	0.45	0.00	0.00	T.	1.28	0.00	0.22	2.30	8.36	1889-90 13.01
1891.....	0.88	2.24	0.81	0.49	0.03	0.02	0.00	0.00	0.27	0.00	0.21	3.99	8.94	1890-91 8.25
1892.....	0.48	1.00	1.69	0.79	1.44	0.06	0.00	0.00	T.	0.34	0.39	2.56	8.75	1891-92 9.93
1893.....	1.04	2.21	4.22	0.34	T.	0.00	T.	0.00	0.01	0.02	0.16	1.40	9.40	1892-93 11.10
1894.....	2.27	2.02	0.29	0.10	1.16	1.16	T.	T.	0.75	0.37	0.27	4.09	12.48	1893-94 8.59
1895.....	4.14	1.70	1.84	0.99	0.52	0.00	T.	T.	0.07	0.16	0.19	0.78	10.39	1894-95 14.67
1896.....	2.89	0.06	1.21	2.82	0.02	0.00	0.07	0.15	0.06	1.28	1.46	1.00	11.02	1895-96 8.42
1897.....	1.93	2.65	1.64	0.30	0.00	T.	0.00	T.	T.	1.19	0.22	0.48	8.41	1896-97 10.32
1898.....	0.42	1.15	0.71	0.00	0.79	0.00	0.00	0.00	1.12	0.03	0.34	0.43	4.99	1897-98 4.94
1899.....	1.92	0.02	2.90	0.36	0.06	0.66	0.00	0.00	0.00	2.01	1.52	1.09	10.54	1898-99 7.98
1900.....	1.52	0.08	0.88	1.21	1.97	T.	T.	0.00	0.16	0.33	4.61	0.33	11.09	1899-00 10.28
Average.....	1.54	1.27	1.70	1.12	0.58	0.17	T.	0.01	0.23	0.65	1.33	1.72	10.31	..... 10.13

## GREATEST PRECIPITATION (INCHES AND HUNDREDTHS) IN TWENTY-FOUR HOURS.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Greatest annual.
1888.....	0.95	0.13	1.05	0.20	0.31	T.	T.	T.	0.06	0.00	1.33	0.71	1.33
1889.....	0.29	0.53	0.55	0.32	0.33	0.00	0.00	T.	0.00	1.73	0.48	0.75	1.73
1890.....	0.74	0.30	0.33	0.15	0.43	0.00	0.00	T.	1.12	0.00	0.22	1.21	1.21
1891.....	0.54	0.50	0.26	0.29	0.02	0.02	0.00	0.00	0.27	0.00	0.21	2.10	2.10
1892.....	0.24	0.38	0.53	0.43	0.32	0.06	0.00	0.00	T.	0.32	0.22	0.66	0.82
1893.....	0.39	1.43	1.22	0.32	T.	0.00	T.	0.00	0.01	0.02	0.15	0.55	1.43
1894.....	1.28	0.62	0.20	0.07	0.94	0.74	T.	T.	0.75	0.23	0.27	1.12	1.28
1895.....	1.46	0.95	0.52	0.34	0.52	0.00	T.	T.	0.06	0.13	0.12	0.40	1.46
1896.....	1.05	0.06	0.50	1.68	0.02	0.00	0.06	0.15	0.06	1.23	1.01	0.56	1.68
1897.....	0.73	1.16	0.50	0.30	0.00	T.	0.00	T.	T.	0.43	0.13	0.25	1.16
1898.....	0.17	0.49	0.30	0.00	0.74	0.00	0.00	0.00	1.12	0.03	0.34	0.32	1.12
1899.....	0.34	0.02	0.99	0.31	0.06	0.60	0.00	0.00	0.00	0.00	0.35	0.36	0.99
Greatest.....	1.46	1.43	1.22	1.68	0.94	0.74	0.06	0.15	1.12	1.73	1.33	2.10	2.10
Date.....	4-5	8-9	20	24-25	14-15	5	25	30	29	22-23	16	29-30	Dec.
Year.....	1895	1893	1893	1896	1894	1894	1896	1896	1890	1889	1888	1891	1891

<sup>a</sup> Also September 25-26, 1893.

## CLIMATOLOGY OF CALIFORNIA.

## MONTHLY EXTREMES OF PRECIPITATION (INCHES AND HUNDREDTHS)

Month	Greatest monthly precipitation		Least monthly precipitation		Times exceeding normal	Month	Greatest monthly precipitation		Least monthly precipitation		Times exceeding normal
	Amount	Date	Amount	Date			Amount	Date	Amount	Date	
January . . . . .	4 14	1895	0 34	1889	7	July . . . . .	0 07	1896	0 00	(a)	5
February . . . . .	4 35	1884	0 00	1885	6	August . . . . .	0 15	1896	0 00	(a)	7
March . . . . .	4 22	1893	0 17	1887	7	September . . . . .	1 26	1890	0 00	(a)	4
April . . . . .	3 42	1884	0 00	1898	1	October . . . . .	3 17	1889	0 00	1890	4
May . . . . .	1 69	1883	0 00	1897	7	November . . . . .	9 54	1885	0 08	1884	4
June . . . . .	1 15	1894	0 00	(a)	2	December . . . . .	4 09	1894	0 42	1882	6

## WEATHER

Month	Average number of—				Month	Average number of—			
	Clear days	Partly cloudy days	Cloudy days	Rainy days		Clear days	Partly cloudy days	Cloudy days	Rainy days
January . . . . .	9	8	14	8	August . . . . .	25	6	0	0
February . . . . .	15	7	6	6	September . . . . .	25	3	2	1
March . . . . .	13	10	8	8	October . . . . .	20	7	4	3
April . . . . .	19	8	3	3	November . . . . .	17	7	6	4
May . . . . .	21	7	3	3	December . . . . .	9	9	13	9
June . . . . .	26	3	1	1	Annual . . . . .	228	77	60	46
July . . . . .	29	2	0	0					

## FOGGY DAYS AND DAYS WITH THUNDERSTORMS IN TWELVE YEARS.

Month	Foggy days		Total thunderstorms	Month	Foggy days.		Total thunderstorms
	Number	Average			Number	Average	
January . . . . .	144	12	1	July . . . . .	0	0	1
February . . . . .	44	4	3	August . . . . .	1	0	2
March . . . . .	25	2	6	September . . . . .	4	0	12
April . . . . .	3	0	1	October . . . . .	15	1	5
May . . . . .	0	0	3	November . . . . .	75	6	1
June . . . . .	0	0	0	December . . . . .	160	13	0

## HIGHEST WIND VELOCITY (MILES PER HOUR) AND DIRECTION FOR TWELVE YEARS

Month.	Year	Velocity	Direction	Month.	Year	Velocity	Direction.
		<i>Miles</i>				<i>Miles</i>	
January . . . . .	1898	32	NW	July . . . . .	1893	24	NW
February . . . . .	1894	30	NW.	August . . . . .	1891	24	NW.
March . . . . .	1896	38	SE	September . . . . .	1899	28	NW
April . . . . .	1894	30	NW	October . . . . .	1892	25	NW
May . . . . .	1894	30	NW.	November . . . . .	1892	30	SE.
June . . . . .	1891	30	NW.	December . . . . .	1891	24	NW



## AVERAGE MONTHLY RELATIVE HUMIDITY (PER CENT) FOR TWELVE YEARS.

Month.	Per cent.	Month.	Per cent.
January .....	79	July .....	88
February .....	70	August .....	84
March .....	68	September .....	42
April .....	58	October .....	56
May .....	51	November .....	65
June .....	41	December .....	82

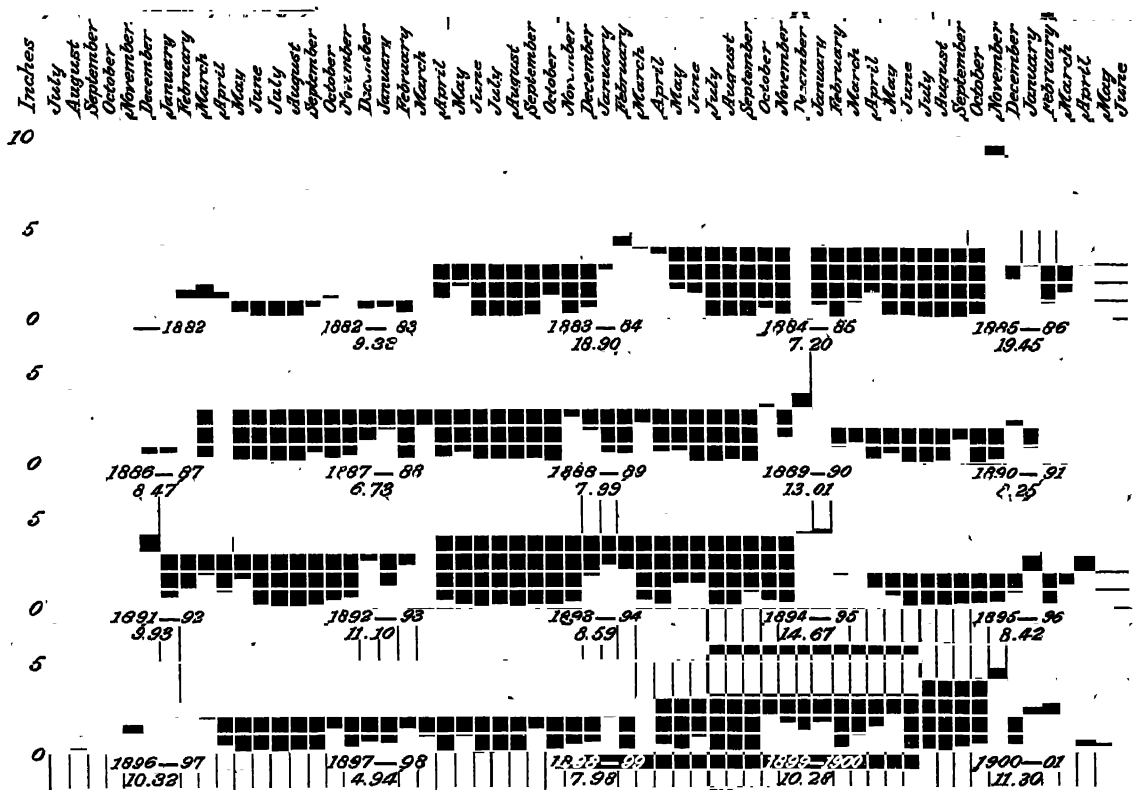


FIG. 12.—Seasonal rainfall at Fresno, Cal., from 1882 to 1901.

## CLIMATOLOGY OF CALIFORNIA.

## SUNSHINE FOR THE YEARS 1898, 1899, AND 1900

[N lat 36° 43']

	Percentage of sunshine recorded during hours ending (local time)—																Total (hours)	Per- centage of pos- sible
	5 <sup>h</sup> a m	6 <sup>h</sup>	7 <sup>h</sup>	8 <sup>h</sup>	9 <sup>h</sup>	10 <sup>h</sup>	11 <sup>h</sup>	Noon	1 <sup>h</sup>	2 <sup>h</sup>	3 <sup>h</sup>	4 <sup>h</sup>	5 <sup>h</sup>	6 <sup>h</sup>	7 <sup>h</sup>	8 <sup>h</sup>		
1898																		
January .....	-	-	-	56	55	63	70	75	82	79	77	65	51	83	-	-	197 6	68
February .....	-	-	71	44	59	71	76	76	83	85	82	69	40	47	-	-	198 7	68
March .....	-	33	38	41	55	61	62	66	68	71	68	66	45	43	46	-	212 2	57
April .....	59	49	53	50	61	68	67	65	63	65	60	53	38	37	40	0	223 2	55
May .....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
June .....	50	50	47	50	63	73	70	72	80	74	73	61	54	52	54	57	285 4	62
July .....	58	55	55	61	69	69	70	75	75	71	68	52	44	41	51	48	283 0	60
August .....	67	73	74	70	75	78	78	75	76	79	70	64	55	69	71	56	311 2	72
September .....	-	64	66	68	66	77	79	83	80	78	70	66	61	56	48	-	264 2	70
October .....	-	100	41	46	53	58	55	56	58	58	54	50	44	36	-	-	177 2	52
November .....	-	-	67	60	60	67	77	80	81	70	57	49	46	-	-	-	190 6	66
December .....	-	-	-	49	45	58	71	74	77	73	67	54	50	-	-	-	175 2	63
Sum .....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Percentage of pos- sible .....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1899																		
January .....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	284 5	94
February .....	-	-	84	82	97	98	100	100	100	100	100	95	84	70	-	-	219 9	59
March .....	-	27	30	43	54	59	72	73	68	74	75	67	55	37	17	-	333.1	84
April .....	-	83	80	82	87	96	95	98	96	87	87	86	81	60	48	-	405 0	92
May .....	61	69	85	95	99	98	97	97	97	98	97	95	91	83	70	88	406 7	92
June .....	84	83	85	90	93	95	99	100	99	97	96	94	90	90	87	88	438 0	98
July .....	81	91	97	100	100	100	100	100	100	100	100	100	99	97	91	88	387 3	92
August .....	-	82	87	93	96	95	96	95	95	94	94	95	93	88	84	60	353 4	95
September .....	-	93	83	89	97	99	98	100	100	98	98	98	89	85	100	-	225 9	65
October .....	-	100	40	49	64	69	77	75	81	77	75	65	47	34	-	-	126 8	41
November .....	-	-	0	11	31	38	49	53	57	61	56	44	25	0	-	-	46 0	15
December .....	-	-	0	1	11	13	14	19	23	23	23	18	10	-	-	-	-	-
Sum .....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Percentage of pos- sible .....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1900																		
January .....	-	-	-	6	7	8	13	15	17	22	25	22	17	6	-	-	46 6	15
February .....	-	-	72	65	77	81	80	81	86	82	81	83	74	62	-	-	236 6	78
March .....	-	82	55	54	68	86	91	93	98	96	97	92	83	64	78	-	303 7	82
April .....	-	52	62	71	76	82	82	84	83	84	78	71	65	60	-	-	295 6	75
May .....	78	58	61	75	80	86	91	89	92	86	78	79	79	67	59	70	337 9	77
June .....	83	83	86	89	91	96	99	100	97	98	95	95	91	80	74	74	398 9	91
July .....	95	93	94	95	96	94	97	97	94	97	96	97	96	94	91	90	424 7	95
August .....	-	89	87	90	92	97	98	99	99	100	99	97	95	90	87	100	396 7	94
September .....	-	75	77	83	95	96	99	98	97	100	97	92	85	74	67	-	338 6	91
October .....	-	50	59	66	74	75	81	84	89	93	84	80	65	58	-	-	267 6	77
November .....	-	-	30	20	27	41	48	50	53	50	44	37	29	100	-	-	121 9	40
December .....	-	-	-	3	3	3	3	4	15	21	15	12	11	-	-	-	26 9	9
Sum .....	256	532	633	722	786	845	882	892	921	928	895	864	796	760	516	334	3,195.7	824
Percentage of pos- sible .....	-	-	-	60	66	70	74	74	77	77	75	72	72	-	-	-	266 3	69

a No record

## CLIMATE OF SANTA CLARA VALLEY.

The Santa Clara Valley lies between the Santa Cruz Mountains on the west and the foothills of the Coast Range on the east. In some respects it is an ideal valley in which to study the general movements of the air and the modifications of the same due to topography. We are fortunately able to discuss the principal climatic factors for the following stations: Menlo Park, San Mateo, San Jose, and the Lick Observatory at Mount Hamilton. Mount Tamalpais and San Francisco should be added to the list for a proper understanding of the air movement through the valley. As has been stated before, the prevailing westerly winds are strongly intensified at the Golden Gate, and the whole effect of the topography is to force the air down the valley. Some interesting relations showing the effect of topography upon rainfall become apparent. The mountain stations show a much larger rainfall. On Tamalpais the rainfall exceeds that of San Francisco in the ratio of 3 to 2, and at Mount Hamilton the rainfall exceeds that of San Jose in the ratio of 2 to 1. The gradual increase in rainfall even in so short a distance as 50 miles is also apparent. The mean annual rainfall at San Jose is 14.88 inches, at Menlo Park 16.43 inches, at San Mateo 20.71 inches, and at San Francisco 23 inches. In other words, within a distance of 50 miles, from San Jose to San Francisco, we find an increase of nearly 8 inches in rainfall, and this increase is nearly in proportion to the distance from San Francisco.

The following comparative data for the six stations for a period of three years serve excellently to show the general features of the climate of the Santa Clara Valley:

### MEAN MONTHLY AND ANNUAL TEMPERATURE (DEGREES FAHRENHEIT).

	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Mean.
1898.													
Mount Tamalpais .....	40.8	46.4	46.6	56.0	50.5	61.9	70.0	67.5	62.6	59.4	51.2	45.7	54.9
San Francisco .....	46.7	52.6	51.2	54.5	52.6	59.0	56.0	58.0	59.0	61.2	55.4	49.7	54.7
Lick Observatory .....	35.7	42.8	39.1	50.8	47.9	62.0	71.4	70.5	61.8	56.0	46.5	48.3	52.3
San Jose .....	45.4	53.3	51.8	57.7	57.0	65.8	65.1	65.2	63.1	61.1	55.0	46.3	57.2
Menlo Park .....	44.9	52.6	49.9	59.1	58.7	66.7	69.0	66.6	65.1	60.5	52.4	46.0	57.6
San Mateo .....	45.9	52.6	54.7	61.3	61.5	70.2	67.8	71.8	64.9	62.3	54.3	47.6	59.6
1899.													
Mount Tamalpais .....	47.8	47.6	44.6	51.6	51.2	66.8	71.0	61.4	73.2	55.3	49.4	47.7	55.6
San Francisco .....	53.0	51.6	52.2	54.6	52.6	56.9	55.9	58.3	58.2	59.3	56.3	49.6	54.9
Lick Observatory .....	42.5	41.0	39.6	47.6	46.3	63.7	71.6	61.3	69.8	50.2	46.9	45.6	52.2
San Jose .....	56.4	52.2	54.7	59.1	58.4	67.8	67.4	65.5	66.0	60.4	57.6	50.4	59.7
Menlo Park .....	47.8	50.0	53.5	57.4	58.4	66.0	65.9	65.8	63.3	59.2	56.0	48.6	57.7
San Mateo .....	51.6	49.0	52.8	56.4	58.0	63.3	67.7	67.4	64.9	61.0	53.3	49.3	58.3
1900.													
Mount Tamalpais .....	47.4	48.4	52.2	48.6	55.4	62.2	69.8	64.0	60.4	55.2	53.6	48.8	55.5
San Francisco .....	50.7	53.6	55.2	54.0	57.0	57.6	58.2	59.7	63.3	58.9	56.3	50.2	56.2
Lick Observatory .....	47.5	43.0	43.1	43.0	52.9	63.8	71.6	62.1	56.3	51.6	51.1	47.2	53.2
San Jose .....	51.3	53.5	56.4	58.3	64.3	67.3	69.3	70.0	63.4	63.4	53.2	50.6	61.1
Menlo Park .....	51.4	52.6	57.6	55.9	62.4	66.5	67.3	67.3	65.6	59.4	57.4	50.2	59.5
San Mateo .....	52.2	52.0	53.3	59.2	65.3	66.9	70.0	67.7	66.1	60.7	59.4	48.6	60.6

## MONTHLY AND ANNUAL PRECIPITATION (INCHES AND HUNDREDTHS)

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1898													
Mount Tamalpais . . . . .	-	6 69	0 73	0 60	4 84	1 05	0 00	0 00	0 80	1 48	1 35	1 42	--
San Francisco . . . . .	1 12	2 13	0 24	0 19	1 44	0 19	0 00	T	1 06	0 86	0 46	1 62	9 31
Lick Observatory . . . . .	2 30	4 16	2 04	0 84	2 41	0 38	0 00	0 00	0 29	1 33	1 23	2 13	17 11
San Jose . . . . .	0 98	1 98	0 52	0 20	0 44	0 06	0 00	0 00	1 13	0 61	0 45	0 44	6 71
San Mateo . . . . .	1 46	3 04	0 64	0 25	0 94	0 19	0 00	0 00	1 57	0 81	0 55	1 35	10 80
Menlo Park . . . . .	1 38	2 24	0 58	0 15	0 63	0 00	0 00	0 00	2 00	0 73	0 31	0 99	9 01
1899													
Mount Tamalpais . . . . .	5 92	0 28	10 38	1 89	1 70	0 29	0 00	0 01	0 00	4 26	7 48	4 65	36 86
San Francisco . . . . .	3 67	0 10	7 61	0 62	0 86	0 01	0 00	T	0 00	3 92	3 79	2 65	23 23
Lick Observatory . . . . .	5 63	0 75	11 11	1 40	1 47	0 39	0 00	0 12	T	6 37	4 82	4 16	36 32
San Jose . . . . .	1 88	0 21	4 17	0 48	0 65	T	0 00	0 00	0 00	3 26	2 79	1 43	14 78
San Mateo . . . . .	4 21	0 37	9 02	1 02	0 67	0 71	0 00	0 02	0 00	3 89	4 70	2 57	27 18
Menlo Park . . . . .	3 62	0 42	6 67	0 34	0 70	0 05	0 00	0 05	0 00	3 08	3 22	1 87	19 39
1900													
Mount Tamalpais . . . . .	6 04	1 91	2 91	2 52	0 58	0 31	0 00	0 00	1 10	3 44	4 31	2 82	25 94
San Francisco . . . . .	4 11	0 64	1 91	1 08	0 32	0 05	T	T	0 46	1 48	3 91	1 37	15 33
Lick Observatory . . . . .	3 26	1 70	3 37	4 06	1 35	T	0 01	0 02	0 08	3 48	7 76	2 21	27 50
San Jose . . . . .	2 05	0 44	1 36	1 66	0 96	0 01	0 02	0 00	0 17	0 62	4 36	1 32	12 97
San Mateo . . . . .	5 65	0 84	2 19	1 23	0 55	0 00	0 00	0 00	0 50	1 64	5 39	2 31	20 20
Menlo Park . . . . .	3 69	0 52	1 46	1 00	0 66	0 05	0 00	0 00	0 00	2 00	4 61	1 99	15 98

The mean annual temperature for three years at Mount Tamalpais is  $55.3^{\circ}$ , and for San Francisco for the same period is  $55.3^{\circ}$ , which is practically the temperature of the Pacific Ocean near the Golden Gate. The mean annual temperature for San Jose for a period of twenty-six years is  $58^{\circ}$ , and for San Francisco  $56^{\circ}$ . The mean annual temperature on Mount Hamilton is  $52^{\circ}$ . At both of the mountain stations there is a well-marked seasonal curve of temperature. Comparing the mean annual temperatures it would appear that from sea level to 1,000 meters elevation the fall in temperature is  $1.5^{\circ}$  C. In January the mean temperatures are, from sea level up,  $10.1^{\circ}$ ,  $7.4^{\circ}$ , and  $5.5^{\circ}$  C., or there is a vertical gradient of  $1^{\circ}$  fall for 260 meters. But in July this gradient is inverted, and the temperatures run from sea level upward as follows:  $13.7^{\circ}$ ,  $21.3^{\circ}$ , and  $22^{\circ}$  C., or at the rate of  $1^{\circ}$  rise for 44 meters. These temperature inversions are due to the water vapor carried by the winds through the Gate from the Pacific and down the valleys. Under normal conditions ascending air cools at the rate of  $1^{\circ}$  C. for 100 meters of ascent. But our experiments at Mount Tamalpais show that often the temperature contrasts are more marked than the general averages quoted above would indicate. Sea-level temperatures ( $12^{\circ}$  or  $13^{\circ}$  C.) and fog often prevail to the 500-meter level, while at 700 meters clear weather with temperatures of  $25^{\circ}$  or  $26^{\circ}$  C. prevail. For example, on July 15, 1900, at 5 p. m., the temperature at San Francisco was  $11^{\circ}$  C. ( $52^{\circ}$  F.), at Point Reyes  $13^{\circ}$  C. ( $55^{\circ}$  F.), and at Mount Tamalpais  $27^{\circ}$  C. ( $80^{\circ}$  F.). It is also interesting to note that the temperatures at Red Bluff, Sacramento, and Fresno were respectively  $39^{\circ}$  C. ( $102^{\circ}$  F.),  $33^{\circ}$  C. ( $92^{\circ}$  F.), and  $38^{\circ}$  C. ( $100^{\circ}$  F.). The mean of three temperature values at different points in fog gave a temperature of  $10^{\circ}$  C. or  $50^{\circ}$  F. as the temperature of condensation or the dew-point. The maximum weight of the water vapor per cubic foot at this temperature is 4.076 grains.

## MENLO PARK

Menlo Park is situated about 25 miles in an air line south of San Francisco, in latitude  $37^{\circ} 27'$  north, longitude  $122^{\circ} 11'$  west. To the east lies the southern portion of San Francisco Bay, about 4 miles wide. The average elevation is between 50 and 60 feet. About 3 miles to the west the land rises, varying in elevation from 100 to 500 feet. To the southwest, at a distance of about 8 miles, the Montara Mountains attain heights of from 1,000 to 2,000 feet.

The mean annual temperature, based upon records covering a period of twenty-three years, is  $57.7^{\circ}$ , which is practically the same temperature as that of San Jose and about  $2^{\circ}$  warmer than that of San Francisco. The coldest month is January, with a mean temperature of  $47.3^{\circ}$ , and the warmest is July, with a mean temperature of  $67.7^{\circ}$ . The highest temperature recorded is  $106^{\circ}$ , in June, 1891, and the lowest  $20^{\circ}$ , in December, 1879, and January, 1888. Reliable frost data are not available.

The mean annual rainfall, based upon records covering twenty-three years, is 16.43 inches, or nearly 2 inches more than at San Jose and 7 inches less than at San Francisco. With the single exception of a heavy rainfall in 1886, no rain has fallen in July. December is the month of heaviest rainfall, and more than half of the annual rainfall occurs in the months of December, January, February, and March. During the past twenty-three years there have been but two years when the rainfall did not exceed 10 inches. In 1878 and 1898 the annual rainfall was but slightly above 9 inches. There have been five years when the annual rainfall exceeded 20 inches. In 1889 the total rainfall for the year was 26.90 inches.

## MONTHLY AND ANNUAL MEAN TEMPERATURE (DEGREES FAHRENHEIT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1878.....	46.3	49.3	55.4	59.2	64.9	67.6	67.0	64.2	61.9	58.2	51.6	45.8	57.6
1879.....	44.8	52.5	55.0	59.9	62.5	71.9	67.6	69.2	65.0	59.1	50.5	45.8	58.6
1880.....	44.1	44.7	48.9	55.3	64.2	66.1	67.0	66.3	63.8	57.8	49.3	50.3	56.5
1881.....	49.3	53.1	53.9	61.0	64.2	67.3	69.7	66.8	63.2	56.0	50.3	49.0	58.6
1882.....	46.6	45.4	52.1	55.7	65.5	66.6	69.0	67.7	63.3	58.8	50.7	49.4	57.6
1883.....	48.4	45.8	54.1	55.1	62.6	67.5	65.4	64.4	65.9	55.8	49.8	46.5	56.4
1884.....	46.4	48.1	53.2	57.2	65.6	65.3	69.3	66.0	59.6	56.5	53.3	48.3	57.4
1885.....	47.8	51.6	55.3	58.5	62.4	63.4	68.0	66.3	64.4	58.6	54.2	49.2	58.8
1886.....	47.8	52.3	50.1	54.9	61.7	65.5	66.5	65.4	61.1	55.5	48.7	50.5	56.7
1887.....	46.4	47.1	55.8	55.4	61.0	66.5	64.2	63.6	64.6	60.8	58.6	48.3	57.3
1888.....	45.8	52.5	51.4	59.0	60.4	67.0	70.2	69.5	66.7	61.7	55.2	53.4	59.4
1889.....	47.5	51.2	56.3	59.1	61.9	66.4	66.0	67.9	66.3	61.3	55.8	50.3	59.2
1890.....	45.4	47.8	53.7	57.0	62.8	63.7	66.9	66.3	64.9	58.9	54.6	48.6	57.6
1891.....	48.7	51.4	55.4	56.1	61.1	67.3	67.6	68.2	64.8	60.9	56.1	48.3	58.8
1892.....	50.3	52.9	56.5	55.3	64.8	66.5	67.9	68.0	65.4	59.6	54.6	51.4	59.4
1893.....	47.5	49.1	51.5	52.8	57.2	63.1	66.2	66.9	61.1	58.1	54.4	50.9	56.6
1894.....	47.0	47.7	49.9	58.6	59.7	63.1	67.8	67.3	66.4	61.2	55.5	49.0	57.8
1895.....	47.5	52.3	53.0	56.6	60.4	66.6	64.8	66.8	63.8	61.9	55.0	48.2	58.1
1896.....	52.7	54.7	55.5	54.8	60.5	67.5	71.6	67.5	64.4	60.5	52.1	51.5	59.7
1897.....	47.5	50.4	50.4	60.0	65.0	68.0	68.6	65.5	64.3	60.2	51.9	48.0	50.3
1898.....	44.9	52.6	49.9	59.1	58.7	66.7	69.0	66.6	65.1	60.5	52.4	46.0	57.6
1899.....	47.8	50.0	53.5	57.4	58.4	66.0	65.9	65.3	63.3	59.2	56.0	48.6	57.7
1900.....	51.4	52.6	57.6	55.9	62.4	66.5	67.3	67.3	65.6	59.4	57.4	50.2	59.5
Mean (23 years).....	47.3	50.2	53.4	57.1	62.1	66.3	67.7	66.7	64.1	59.2	53.2	49.0	57.7

## MONTHLY AND ANNUAL PRECIPITATION (INCHES AND HUNDREDTHS).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1878.....	2.98	2.21	1.72	1.36	0.10	0.00	0.00	T.	0.00	0.00	0.42	0.25	9.04
1879.....	3.09	2.73	4.27	1.19	0.98	0.03	0.00	0.00	0.00	0.48	1.66	3.96	18.39
1880.....	1.92	1.79	1.65	6.44	0.69	0.00	0.00	0.00	0.00	0.00	0.59	8.98	22.01
1881.....	3.70	1.56	0.68	2.66	0.00	0.24	0.00	0.00	0.00	0.36	0.71	1.97	11.88
1882.....	0.65	1.17	3.71	0.67	0.18	0.00	0.00	0.00	0.23	1.25	1.69	0.52	10.07
1883.....	2.38	0.52	2.70	0.76	2.49	0.00	0.00	0.00	0.20	0.73	0.28	0.85	10.91
1884.....	3.35	4.07	4.80	3.40	0.00	3.16	0.00	0.05	0.04	1.86	0.27	4.92	25.92
1885.....	1.89	0.12	0.50	1.98	0.04	0.00	0.00	0.00	0.02	0.09	6.22	2.17	13.03
1886.....	4.97	0.37	1.65	3.34	0.08	0.00	0.24	0.00	0.00	0.86	0.40	1.26	13.17
1887.....	0.72	4.92	0.46	1.18	0.01	0.00	0.00	0.00	0.22	0.00	0.85	2.16	10.52
1888.....	3.17	1.36	2.31	0.02	0.37	0.09	0.00	0.00	0.98	0.00	3.72	2.59	14.61
1889.....	0.65	0.54	5.75	0.69	1.08	0.00	0.00	0.00	0.00	4.96	2.38	10.85	26.90
1890.....	7.45	3.27	2.76	0.51	1.48	0.00	0.00	0.00	0.18	0.00	0.00	2.61	18.26
1891.....	0.69	7.02	2.17	1.83	0.38	0.03	0.00	0.00	0.28	0.00	0.46	5.26	18.12
1892.....	1.07	1.39	2.91	0.47	1.43	0.00	0.00	0.00	0.00	1.14	4.69	6.55	19.65
1893.....	2.44	2.75	4.33	1.26	0.23	0.00	0.00	0.00	0.09	0.09	1.51	1.90	14.60
1894.....	4.60	2.80	0.57	0.00	0.99	0.01	0.00	0.00	1.65	1.51	0.46	9.65	22.24
1895.....	7.12	1.59	2.30	1.44	0.36	0.00	0.00	0.00	0.00	1.16	1.45	1.18	16.55
1896.....	6.76	0.00	2.15	3.65	0.45	0.00	0.00	0.85	0.58	1.13	4.67	3.14	23.38
1897.....	1.69	3.92	4.20	0.13	0.00	0.00	0.00	0.00	0.00	1.91	0.76	1.63	14.24
1898.....	1.88	2.24	0.58	0.15	0.63	0.00	0.00	0.00	2.00	0.73	0.31	0.99	9.01
1899.....	3.62	0.42	6.67	0.34	0.07	0.05	0.00	0.05	0.00	3.08	3.22	1.87	19.39
1900.....	3.69	0.52	1.46	1.00	0.66	0.05	0.00	0.00	0.00	2.00	4.61	1.99	15.96
Average (23 years).....	3.04	2.06	2.62	1.50	0.55	0.16	0.01	0.04	0.28	1.01	1.80	3.35	16.43

## CLIMATOLOGY OF CALIFORNIA.

## MAXIMUM TEMPERATURES (DEGREES FAHRENHEIT)

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1878	..	..	73	79	90	98	86	82	92	85	70	72
1879	..	70	82	82	90	94	90	98	91	82	70	66
1880	66	66	72	78	90	92	86	82	90	78	74	62
1881	66	72	82	82	88	86	90	84	90	76	70	66
1882	64	66	80	84	85	80	92	88	90	80	73	72
1883	64	74	78	74	92	90	96	96	99	80	72	66
1884	60	74	72	76	86	80	96	89	82	73	70	61
1885	64	72	74	82	92	81	94	96	95	88	70	66
1886	68	70	74	78	90	88	94	98	97	80	68	70
1887	74	65	81	84	102	103	87	86	94	89	75	60
1888	64	76	76	88	88	90	101	96	91	85	72	63
1889	64	69	81	81	86	85	96	88	96	88	75	62
1890	63	65	74	82	96	92	94	92	88	86	78	67
1891	68	62	74	80	88	106	95	104	88	87	71	62
1892	65	69	79	79	96	91	102	102	90	78	75	67
1893	65	68	80	74	86	96	88	84	80	82	72	71
1894	60	62	70	84	86	90	90	98	98	88	75	60
1895	68	67	70	82	90	94	90	90	92	84	78	68
1896	66	72	72	72	98	94	92	84	88	87	75	62
1897	57	68	68	85	94	95	94	86	92	78	70	66
1898	58	70	75	89	85	98	97	90	86	86	78	65
1899	80	78	80	84	90	95	92	92	92	96	69	64
1900	64	68	75	73	86	91	92	99	95	84	72	66
Absolute maximum and year	80 1899	78 1899	82 α 1879	89 1898	102 1887	106 1891	102 1892	104 1891	99 1883	96 1899	78 α 1890	72 α 1878

α Also other years.

## MINIMUM TEMPERATURES (DEGREES FAHRENHEIT)

1878	..	..	34	44	50	55	52	54	45	38	32	24
1879	..	30	35	46	46	58	54	58	50	40	30	20
1880	26	28	30	42	48	50	56	52	52	44	28	32
1881	32	38	34	48	50	54	54	56	46	36	30	30
1882	26	24	32	40	52	55	58	54	45	36	30	32
1883	24	24	40	40	46	54	54	52	48	37	29	27
1884	28	24	36	45	54	56	56	53	44	40	35	24
1885	32	32	38	40	49	49	51	51	46	39	35	31
1886	28	37	34	37	46	50	52	50	42	38	31	32
1887	28	28	34	42	42	44	46	44	46	40	26	32
1888	20	34	36	42	50	56	52	54	50	40	33	38
1889	32	32	40	46	48	54	54	50	48	44	38	34
1890	28	30	36	40	47	52	53	52	47	41	36	32
1891	29	32	37	43	50	51	53	53	47	41	35	29
1892	36	32	38	40	46	51	52	50	48	42	38	38
1893	31	35	36	39	44	48	50	50	45	40	33	30
1894	30	33	33	40	43	48	52	40	49	42	38	38
1895	32	35	35	38	46	48	42	56	48	46	36	29
1896	31	36	34	40	50	52	55	54	50	44	30	36
1897	32	32	35	42	50	56	56	52	49	42	34	29
1898	27	36	32	40	32	50	52	52	50	44	34	28
1899	32	26	38	44	44	52	50	50	50	40	42	32
1900	36	36	38	38	50	52	52	54	50	40	40	36
Absolute minimum and year	20 1888	24 α 1882	30 1880	37 1886	32 1898	44 1887	42 1895	40 1894	42 1886	36 α 1881	26 1887	20 1879

α Also other years.

## SAN MATEO.

[Data from records of Southern Pacific Railway Company.]

San Mateo is situated in latitude  $37^{\circ} 34'$  north, longitude  $122^{\circ} 19'$  west, about 14 miles in an air line south and slightly east of San Francisco. By railroad the distance is about 22 miles. The elevation is about 22 feet above sea level. To the north and east, at a distance of about 1 mile, are the waters of San Francisco Bay, while to the west, stretching northwest to southeast, are the hills of the Buriburi ridge, with elevations varying from 200 to 600 feet.

The mean annual temperature, based upon records covering a period of twenty-seven years, from 1874 to 1900, inclusive, is  $57.6^{\circ}$ , which, it is interesting to notice, is almost that of Menlo Park,  $57.7^{\circ}$ , and practically the same as that of San Jose. The coldest month is January, with a mean temperature of  $47.9^{\circ}$ , and the warmest is July,  $65.4^{\circ}$ . It will be noticed that July is  $2.3^{\circ}$  cooler than at Menlo Park, and  $1.3^{\circ}$  cooler than at San Jose, but  $6.6^{\circ}$  warmer than at San Francisco. The highest temperature recorded is  $100^{\circ}$ , in May, 1887, and the lowest  $25^{\circ}$ , on several dates. Reliable frost data are not available.

The mean annual rainfall is 20.71 inches, or about 4 inches more than at Menlo Park. With the single exception of a rain in 1886, no rain has fallen during the month of July. The month of heaviest rainfall is January, and in this respect San Mateo differs from other points in the valley, December being the month of heaviest rainfall elsewhere. In the past twenty-seven years there has been but one year when the rainfall did not exceed 10 inches. In 1877 but 8 inches of rain fell. There have been fourteen years when the annual rainfall exceeded 20 inches. In 1894 over 34 inches fell. The greatest monthly precipitation amounted to 12.44 inches, during December, 1889.

## MONTHLY AND ANNUAL MEAN TEMPERATURE (DEGREES FAHRENHEIT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1874.....	48.4	48.4	51.0	59.3	62.8	67.7	64.3	67.0	63.2	57.6	58.1	46.8	57.5
1875.....	47.0	48.4	53.2	57.1	61.8	61.2	59.7	58.2	57.4	57.3	56.3	50.0	55.6
1876.....	46.0	48.7	52.7	55.8	60.0	66.6	60.3	61.6	60.6	57.5	54.6	47.6	57.7
1877.....	48.7	53.6	55.5	55.5	56.4	66.4	63.8	61.2	62.8	58.0	52.6	50.0	57.0
1878.....	50.9	50.5	53.0	56.0	60.8	64.5	66.4	66.3	65.4	63.4	57.1	49.0	58.6
1879.....	48.3	53.9	58.2	60.8	60.8	68.6	65.6	68.0	64.1	61.1	51.8	46.0	58.9
1880.....	43.1	40.5	49.9	55.1	63.1	65.9	67.2	64.5	65.0	59.6	49.3	56.8	56.2
1881.....	50.8	51.7	50.8	56.5	59.2	60.5	62.0	60.0	58.8	51.6	46.5	45.6	54.5
1882.....	43.6	42.5	47.7	49.1	56.5	58.5	60.2	62.8	60.7	56.6	49.4	48.5	53.0
1883.....	43.2	44.9	52.3	52.9	57.6	64.5	62.1	60.9	64.3	54.9	49.1	46.1	54.4
1884.....	44.8	45.8	50.2	53.0	59.2	60.8	64.3	60.2	59.8	54.1	52.5	48.9	54.5
1885.....	47.6	51.0	53.5	56.6	60.2	61.2	63.1	65.2	66.4	61.3	57.9	53.6	58.6
1886.....	50.3	54.7	53.8	57.8	64.0	66.6	68.4	67.5	65.1	59.2	54.0	54.1	59.6
1887.....	50.3	47.0	55.1	57.2	60.6	64.9	63.6	63.6	64.3	64.4	51.2	50.1	57.7
1888.....	46.5	51.2	51.7	58.3	58.2	67.1	69.7	66.7	62.8	58.1	49.3	50.6	57.5
1889.....	45.5	49.1	54.4	58.6	69.7	63.9	60.6	72.0	64.8	57.4	54.9	49.3	57.5
1890.....	44.1	44.7	49.1	53.6	60.7	59.3	60.4	65.3	61.8	57.2	55.6	47.1	54.9
1891.....	47.5	50.3	52.7	55.4	59.2	65.7	67.3	68.4	66.1	58.5	56.4	47.2	57.9
1892.....	47.7	49.5	53.2	53.1	60.2	60.3	64.0	64.5	62.4	56.5	53.3	51.3	56.4
1893.....	47.9	49.1	54.4	56.0	62.6	65.3	69.0	65.5	63.1	59.3	55.3	53.0	58.4
1894.....	49.3	49.9	51.7	59.9	62.4	62.7	67.4	67.3	69.6	62.3	57.6	51.9	59.4
1895.....	49.6	52.9	54.5	58.4	62.3	64.6	65.0	63.5	65.3	61.7	56.5	50.2	58.7
1896.....	53.6	56.0	58.0	57.1	63.3	70.0	69.6	67.2	64.4	60.8	53.6	53.2	60.6
1897.....	49.7	52.2	52.5	62.7	65.6	68.4	70.5	66.0	66.4	60.9	53.9	48.6	59.3
1898.....	45.9	52.6	54.7	61.3	61.5	70.2	67.3	71.3	64.9	62.3	54.3	47.6	59.6
1899.....	51.6	49.0	52.8	56.4	58.0	63.3	67.7	67.4	64.9	61.0	58.3	49.3	58.3
1900.....	52.2	52.0	58.3	59.2	65.3	66.9	70.0	67.7	66.1	60.7	59.4	48.6	60.6
Mean (27 years).....	47.9	49.6	53.1	56.3	60.3	64.3	65.4	65.2	63.7	59.0	53.3	49.6	57.6

## CLIMATOLOGY OF CALIFORNIA.

## MAXIMUM TEMPERATURES (DEGREES FAHRENHEIT)

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1878	64	64	68	76	80	84	86	88	92	86	70	64
1879	60	66	77	82	83	92	84	99	92	84	64	65
1880	60	58	70	66	86	90	88	80	89	78	80	63
1881	61	65	77	74	82	77	82	78	86	67	67	63
1882	59	58	73	73	80	76	86	81	84	76	62	64
1883	60	69	74	65	88	98	91	90	96	78	68	62
1884	59	68	65	68	80	74	86	76	78	76	68	64
1885	66	68	75	72	86	75	88	92	92	82	74	69
1886	66	68	72	76	84	86	87	90	93	78	73	67
1887	70	65	74	80	100	92	80	83	91	89	77	61
1888	64	72	72	84	70	80	92	90	84	81	62	59
1889	62	70	76	76	84	79	88	82	90	84	71	64
1890	58	60	62	82	86	84	80	85	80	83	68	62
1891	62	60	72	80	79	99	86	98	84	78	70	60
1892	62	65	76	68	87	83	92	92	80	75	71	68
1893	60	65	76	71	83	94	86	82	72	82	60	72
1894	60	63	70	83	85	81	89	99	90	87	77	62
1895	62	69	71	75	89	94	92	88	93	86	79	64
1896	66	73	74	68	91	87	88	82	82	82	64	65
1897	59	65	65	82	91	92	90	85	92	72	65	60
1898	58	69	75	87	73	94	95	83	86	85	80	67
1899	73	67	67	85	84	85	88	90	92	93	71	64
1900	64	69	71	77	83	87	87	95	93	84	70	67
Absolute maximum and year	73 1899	73 1896	77 α 1879	87 1898	100 1887	99 1891	95 1898	99 α 1879	96 1883	93 1899	80 α 1880	72 1893

α Also other years

## MONTHLY AND ANNUAL PRECIPITATION (INCHES AND HUNDREDTHS)

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1874	5 22	1 32	2 16	0 99	0 79	0 00	0 00	0 00	0 00	2 46	3 71	0 07	16 72
1875	4 62	0 56	0 82	0 00	0 00	0 00	0 00	0 00	0 00	0 00	7 85	3 15	17 00
1876	6 30	4 61	4 16	0 20	0 00	0 00	0 00	0 00	0 00	2 29	0 00	0 00	17 56
1877	3 26	0 75	1 01	0 00	0 03	0 00	0 00	0 00	0 00	0 80	0 81	1 34	8 00
1878	9 87	9 74	3 58	1 29	0 06	0 00	0 00	0 00	0 48	0 80	0 72	0 27	26 81
1879	3 86	3 48	5 85	1 24	1 58	0 09	0 00	0 00	0 00	0 52	1 77	3 14	21 53
1880	2 51	1 64	2 13	3 70	0 76	0 00	0 00	0 00	0 00	0 00	0 52	11 37	27 63
1881	4 26	2 34	0 80	1 58	0 03	0 22	0 00	0 00	0 16	0 69	1 16	3 01	14 25
1882	0 79	1 72	3 98	1 11	0 03	0 00	0 00	0 00	0 18	1 50	2 98	0 84	13 18
1883	1 93	0 59	2 72	1 81	2 92	0 00	0 00	0 00	0 30	1 14	0 21	0 92	12 54
1884	3 40	4 87	6 38	3 40	0 05	2 91	0 00	T	0 17	1 78	0 21	7 59	30 76
1885	2 36	0 19	0 52	4 20	0 05	0 10	0 00	0 00	0 02	0 13	6 88	2 34	16 79
1886	6 20	0 35	1 20	4 50	0 15	0 00	0 07	0 00	0 00	1 69	0 77	0 95	15 88
1887	1 21	9 16	0 72	1 68	0 00	0 00	0 00	0 00	0 47	0 00	1 08	3 44	17 76
1888	4 73	1 21	3 97	0 13	0 67	0 08	0 00	0 00	1 03	0 00	4 16	4 04	20 02
1889	1 17	0 75	6 94	0 84	1 08	0 00	0 00	0 00	0 00	5 98	4 01	12 44	33 21
1890	8 69	4 39	3 94	0 79	0 58	0 00	0 00	0 00	0 10	0 10	0 00	2 86	21 45
1891	0 90	9 06	2 57	1 95	0 35	0 00	0 00	0 00	0 65	0 02	0 65	7 88	24 01
1892	1 88	1 55	2 49	1 01	1 57	0 00	0 00	0 00	0 03	1 45	7 67	5 91	28 56
1893	3 09	3 68	6 49	1 92	0 00	0 00	0 00	0 00	0 09	0 14	2 74	2 95	21 10
1894	7 42	6 62	1 07	0 94	0 61	0 00	0 00	0 00	1 75	3 08	0 72	12 12	34 28
1895	9 50	3 23	0 05	1 61	0 38	0 00	0 00	0 00	0 31	0 83	2 08	1 63	19 12
1896	8 89	0 24	2 94	5 00	0 83	0 00	0 00	0 46	0 52	1 31	4 87	2 98	28 04
1897	2 02	5 76	6 42	0 06	0 00	0 05	0 00	0 00	0 00	2 61	1 00	1 84	19 76
1898	1 46	3 04	0 64	0 25	0 94	0 19	0 00	0 00	1 57	0 81	0 55	1 85	10 80
1899	4 21	0 37	9 02	1 02	0 67	0 71	0 00	0 02	0 00	3 89	4 70	2 57	27 18
1900	5 55	0 84	2 19	1 23	0 55	0 00	0 00	0 00	0 50	1 64	5 39	2 81	20 20
Average (27 years).....	4 27	3 04	3 14	1 76	0 55	0 16	T	0 02	0 31	1 30	2 49	3 68	20 71



## MINIMUM TEMPERATURES (DEGREES FAHRENHEIT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1878.....	28	38	37	45	50	54	56	54	54	48	44	30
1879.....		34	47	52	44	55	56	50	50	48	38	25
1880.....	26	30	34	42	50	52	56	50	48	46	30	34
1881.....	34	40	36	45	50	49	49	50	48	34	30	32
1882.....	27	26	32	39	48	50	52	54	50	42	32	31
1883.....	25	28	41	45	48	52	52	50	50	38	31	30
1884.....	31	28	38	48	50	54	55	51	50	43	39	28
1885.....	34	36	41	48	50	52	58	56	54	46	43	40
1886.....	34	44	40	48	54	55	57	56	50	45	39	40
1887.....	34	32	42	44	50	50	54	54	50	45	32	38
1888.....	26	40	40	50	50	60	60	56	52	44	36	38
1889.....	32	32	40	50	50	55	50	50	45	46	38	36
1890.....	30	30	38	44	48	50	50	52	51	40	38	34
1891.....	30	32	39	44	50	50	55	56	52	42	38	30
1892.....	35	35	42	44	48	50	54	52	53	43	37	25
1893.....	35	36	39	46	52	55	58	56	52	44	38	39
1894.....	32	36	39	48	51	52	56	57	54	49	42	36
1895.....	35	37	39	46	50	53	58	57	53	51	41	34
1896.....	38	41	39	47	51	55	59	60	56	48	38	42
1897.....	37	36	39	50	53	58	58	56	54	46	40	34
1898.....	30	37	39	45	53	58	58	57	55	48	37	23
1899.....	37	32	42	48	48	56	59	57	51	45	44	35
1900.....	39	37	45	44	57	57	60	60	53	45	44	38
Absolute minimum and year.....	25	26	32	39	44	49	49	50	45	34	30	25
	1883	1882	1882	1882	1879	1881	1881	α1879	1889	1881	α1880	1879

α Also other years.

## SAN JOSE.

San Jose, the county seat of Santa Clara County, lies about 50 miles southeast of San Francisco, or about 8 miles southeast of the lower end of San Francisco Bay.

The elevation of San Jose varies from about 80 to 100 feet above sea level, and an elevation of 400 feet, except immediately south of the city, is not reached within a radius of 5 miles. Within 10 miles elevations ranging from 400 to 2,000 feet are reached. The general movement of the air is from the northwest. The influence of the Golden Gate, with its strong indraft of cool, fog-laden air is noticeable throughout the Santa Clara Valley. The valley, however, is somewhat sheltered from the strong westerly surface currents prevalent on the coast of California. Summer fogs, especially when low, do not drift inland, being as a rule barred by the mountains. High fogs occasionally blow over and down the mountain sides. Low winter fogs are not infrequent, and are probably due as elsewhere to a settling of the cooler air in the lowlands.

The mean annual temperature, based upon records extending over a period of twenty-six years, is 58°. The coldest month is January, with a mean temperature of 48°, and the warmest is July, 66.7°.

The highest temperature recorded within this period of twenty-six years was 104°. The temperature has reached 100° but five times. The lowest temperature was 18°, or an absolute range of 86°. No frost data are available.

The mean annual rainfall for twenty-six years is 14.88 inches. About half of this falls in December, January, and February. July and August are practically rainless, as only three times during July and once in August has rain fallen to an appreciable extent. The rain has exceeded 20 inches in four years and less than 10 has fallen in four years. The driest year was 1875, with 5.51 inches, and the year with greatest rainfall was 1889, with 25.55 inches. The greatest monthly rainfall was 10.55 in December, 1889.

## CLIMATOLOGY OF CALIFORNIA.

## MAXIMUM TEMPERATURES (DEGREES FAHRENHEIT)

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1878....	78	68	75	74	83	94	90	92	86	82	75	75
1879..	72	72	86	82	86	94	94	99	93	87	72	74
1880..	66	66	78	66	89	89	91	90	92	87	75	68
1881..	66	72	83	85	89	82	93	84	92	84	75	64
1882..	64	62	80	69	88	84	92	90	93	80	74	68
1883..	66	82	82	70	99	103	92	92	96	81	71	63
1884..	70	71	72	71	81	80	94	90	84	83	72	72
1885..	68	68	80	76	90	78	86	95	98	90	74	66
1886..	64	72	74	75	83	93	96	94	94	83	70	65
1887..	71	70	78	84	104	95	92	87	94	88	80	65
1888..	65	78	75	86	82	88	96	98	98	89	74	65
1889..	62	71	78	80	89	85	93	89	95	86	75	62
1890..	60	68	72	82	93	90	92	90	86	85	76	70
1891..	68	65	76	83	87	104	99	101	89	83	76	68
1892..	65	67	76	74	95	90	100	96	87	85	78	72
1893..	62	67	78	74	85	94	89	90	79	81	77	78
1894..	63	64	76	85	84	89	92	98	94	87	77	60
1895..	62	71	71	81	87	96	94	92	92	86	84	70
1896..	65	75	78	68	93	94	94	85	83	88	69	64
1897..	60	73	70	84	90	92	90	88	...	78	69	64
1898..	60	70	78	87	76	89	93	92	87	82	78	65
1899..	78	80	72	80	86	88	87	82	89	90	70	62
Absolute maximum and year.	78 α 1878	82 1883	86 1879	87 1898	104 1887	104 1891	100 1892	101 1891	98 1885	90 α 1885	84 1895	78 1898

α Also 1899

## MINIMUM TEMPERATURES (DEGREES FAHRENHEIT)

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1878.....	27	38	37	40	47	41	50	52	48	40	30	25
1879..	30	37	41	45	50	48	52	52	52	42	32	24
1880.....	27	30	33	40	41	50	52	50	48	42	25	32
1881.....	34	35	35	45	48	47	52	52	47	32	31	32
1882.....	24	30	35	40	44	50	52	52	50	39	32	30
1883.....	24	24	39	37	42	54	54	52	52	41	30	29
1884.....	30	28	39	44	48	52	52	53	48	40	37	30
1885..	35	36	40	40	48	50	50	54	50	44	38	34
1886..	32	40	37	40	48	50	54	53	48	41	35	34
1887..	31	32	38	42	44	46	50	50	50	45	30	33
1888..	22	35	38	44	48	54	51	54	55	48	38	39
1889..	32	32	41	47	51	56	55	52	50	46	38	34
1890....	30	32	37	43	46	53	52	51	50	42	38	35
1891..	30	31	38	44	50	51	53	55	49	43	36	31
1892.....	37	35	42	42	47	52	53	54	48	42	37	34
1893..	35	36	38	44	45	51	48	52	45	41	37	30
1894.....	18	24	26	29	32	35	41	42	37	35	27	22
1895.....	32	37	36	43	46	50	54	53	48	43	34	30
1896.....	33	38	37	42	42	52	55	53	50	43	30	37
1897.....	26	24	26	34	35	40	54	54	.....	42	35	29
1898.....	30	35	36	42	50	50	48	54	52	47	36	30
1899.....	34	30	37	46	44	53	54	52	50	45	46	36
Absolute minimum and year.	18 1894	24 α 1883	26 b 1894	29 1894	32 1894	35 1894	41 1894	42 1894	37 1894	32 1881	25 1880	22 1894

α Also 1894 and 1897

b Also 1897

## CLIMATE OF SANTA CLARA VALLEY.

119

## MONTHLY AND ANNUAL MEAN TEMPERATURE (DEGREES FAHRENHEIT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1874.....	46.8	49.3	51.8	58.8	67.7	76.1	71.1	68.7	71.0	64.3	56.8	57.9	61.7
1875.....	49.8	53.3	54.4	62.1	68.6	68.5	68.8	70.1	64.7	65.5	58.5	58.1	60.9
1876.....	42.2	49.6	57.8	57.9	59.2	69.6	65.2	66.1	65.2	64.0	55.5	47.6	58.3
1877.....	50.6	51.4	55.8	55.1	57.2	68.0	67.4	64.9	63.9	58.2	54.1	51.9	58.2
1878.....	58.6	52.1	54.1	54.8	50.1	64.8	64.8	65.7	62.2	56.4	52.8	46.1	56.5
1879.....	46.9	52.8	55.9	56.5	57.8	66.1	66.3	67.1	64.0	59.5	52.4	46.5	57.6
1880.....	45.0	45.7	49.0	52.9	59.0	62.1	64.7	65.7	62.1	58.9	48.5	52.6	55.5
1881.....	57.7	53.2	54.5	60.0	62.3	60.5	66.3	64.3	62.2	56.8	49.7	47.1	57.9
1882.....	40.4	45.3	52.1	51.9	58.9	61.9	65.6	65.6	65.4	56.6	52.0	47.8	55.2
1883.....	43.7	46.1	53.0	58.7	59.8	68.8	66.8	66.3	67.1	57.5	50.8	47.3	56.7
1884.....	48.0	48.6	52.6	56.2	60.2	61.6	65.4	65.6	62.0	56.3	54.5	51.7	56.8
1885.....	49.4	51.9	55.8	55.5	60.2	61.3	65.8	65.4	64.6	61.6	56.3	52.4	58.3
1886.....	49.1	53.3	51.0	54.7	60.5	63.9	66.3	66.7	63.7	57.3	52.3	52.4	57.6
1887.....	50.3	48.2	54.8	54.3	58.6	63.9	64.3	63.3	64.7	62.5	54.6	50.5	57.5
1888.....	46.4	52.6	52.8	58.3	59.8	65.2	66.8	68.6	68.0	62.3	56.5	52.9	59.2
1889.....	47.6	50.9	56.7	59.7	61.9	66.2	66.1	67.2	67.7	61.5	56.3	50.5	59.4
1890.....	45.0	48.7	53.9	56.7	63.5	68.6	65.9	66.8	64.9	60.5	55.1	48.6	57.8
1891.....	49.0	51.3	54.4	55.4	60.0	65.2	69.4	69.4	65.4	61.9	56.5	48.2	58.8
1892.....	50.7	52.5	54.9	54.5	61.4	62.7	66.0	66.8	64.2	60.0	55.8	50.3	58.3
1893.....	47.7	50.0	53.1	54.4	58.7	61.1	65.3	65.7	62.0	58.6	55.5	52.3	57.1
1894.....	47.3	48.6	49.8	57.6	60.8	62.1	67.6	67.7	67.6	61.0	57.0	50.0	58.1
1895.....	48.7	53.6	53.5	56.8	60.2	66.2	66.6	67.3	64.0	62.1	56.0	49.3	58.6
1896.....	49.0	54.8	56.1	53.4	59.4	75.2	69.3	65.7	62.7	62.0	52.2	51.2	59.2
1897.....	47.6	49.8	48.5	59.5	62.6	65.8	68.2	65.6	64.8	58.5	51.4	47.6	57.5
1898.....	45.4	53.3	51.8	57.7	57.0	65.3	65.1	65.2	63.1	61.1	55.0	46.8	57.2
1899.....	56.4	52.2	54.7	59.1	58.4	67.8	67.4	65.5	66.0	60.4	57.6	50.4	59.7
Means (26 years) .....	48.2	50.7	53.6	56.4	60.1	65.5	66.7	66.4	64.7	60.2	54.1	50.1	58.1

## MONTHLY AND ANNUAL PRECIPITATION (INCHES AND HUNDREDTHS).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1874.....	2.61	0.77	2.83	0.87	0.21	0.00	0.00	0.00	0.10	1.81	1.91	0.08	11.19
1875.....	2.75	0.41	0.39	0.00	0.00	0.45	0.00	0.00	0.00	0.00	0.00	1.51	5.51
1876.....	4.08	3.41	3.11	0.41	0.25	0.00	0.00	0.00	0.08	1.35	0.02	0.00	12.71
1877.....	2.23	0.48	0.78	0.00	0.05	0.00	0.00	0.00	0.00	0.37	0.85	1.87	6.68
1878.....	5.53	6.94	2.22	1.48	0.02	0.00	0.00	0.00	0.48	0.80	0.76	0.97	19.20
1879.....	1.48	3.18	5.85	1.24	1.58	0.06	0.00	0.00	0.00	0.87	1.79	2.99	19.04
1880.....	1.52	1.34	0.96	3.66	0.67	0.00	0.00	0.00	0.00	0.00	0.49	5.60	14.24
1881.....	2.12	2.04	0.80	1.28	0.00	0.12	0.00	0.00	0.02	0.45	0.88	1.83	9.54
1882.....	1.17	1.49	4.26	1.10	0.55	0.00	0.00	0.00	0.04	0.87	1.32	0.82	11.62
1883.....	3.86	0.94	2.70	0.66	2.13	0.00	0.00	0.00	0.09	0.67	0.28	0.37	11.75
1884.....	3.13	3.68	6.23	3.38	0.05	2.15	0.00	0.00	0.08	1.50	0.06	3.90	24.21
1885.....	1.83	0.18	0.86	2.75	0.11	T.	0.00	0.00	0.00	0.06	7.89	2.11	15.29
1886.....	3.59	1.12	1.89	4.47	0.00	0.00	0.03	0.00	0.00	0.49	0.73	0.71	13.03
1887.....	0.68	6.81	0.63	1.28	0.00	0.00	0.02	0.00	0.61	0.03	0.70	2.53	13.29
1888.....	3.06	1.09	3.00	0.31	0.60	0.22	0.00	0.00	0.60	0.00	3.88	2.44	15.20
1889.....	0.50	0.70	5.80	0.79	0.96	0.04	0.00	0.00	0.00	4.43	1.73	10.55	25.55
1890.....	6.52	3.64	2.08	0.55	0.75	0.00	0.00	0.00	0.05	0.00	0.05	2.40	16.04
1891.....	0.55	5.27	2.46	1.79	0.28	0.05	0.00	0.00	0.37	0.08	0.46	5.34	17.13
1892.....	1.11	1.60	4.75	0.65	1.60	0.05	0.00	0.00	0.00	1.00	4.00	7.77	22.53
1893.....	2.95	2.68	5.12	1.35	0.30	0.00	0.00	0.00	0.00	0.00	0.81	1.69	14.90
1894.....	4.73	2.61	0.69	0.83	1.36	0.40	0.00	0.00	1.08	1.82	0.55	7.80	21.17
1895.....	6.23	1.42	1.46	2.05	1.86	0.00	0.00	0.00	0.05	0.83	1.03	0.34	15.37
1896.....	5.17	0.27	2.22	2.79	0.44	0.00	0.01	0.74	0.32	1.30	2.32	2.55	18.63
1897.....	1.68	3.43	2.64	0.91	0.16	T.	0.00	0.00	0.21	1.01	0.37	1.20	11.61
1898.....	0.93	1.93	0.52	0.20	0.44	0.06	0.00	0.00	1.13	0.61	0.45	0.44	6.71
1899.....	1.88	0.21	4.17	0.43	0.65	T.	0.00	0.00	0.00	3.26	2.70	1.43	14.73
Average (26 years) .....	2.77	2.22	2.63	1.35	0.56	0.14	T.	0.03	0.20	0.89	1.39	2.70	14.83

## MOUNT HAMILTON.

[Lick Observatory]

The director of the Lick Observatory, Dr. Wallace W. Campbell, has kindly placed at the disposal of the Weather Bureau the observations made at Mount Hamilton by different members of the observatory staff from 1888 to 1900. The following named gentlemen have at various times acted as observers: Charles B. Hill, A. J. Burnham, H. K. Curtis, A. O. Leuschner, A. L. Colton, C. D. Perrine, R. G. Atken, W. H. Wright, H. K. Palmer, E. F. Coddington, and A. J. Cloud.

The observatory is situated on Mount Hamilton, a peak in the Coast Range, in Santa Clara County. The elevation of the station is 1,283 meters (4,209 feet) above sea level. The observatory is situated in latitude  $37^{\circ} 20' 25.6''$  north, longitude  $121^{\circ} 38' 4.22''$  west. The mountain is about 14 miles in an air line directly east of the city of San Jose.

The records for temperature at Mount Hamilton cover a period of twelve years and for precipitation twenty years. The mean annual temperature is  $52^{\circ}$ . The coldest month is January, with a mean temperature of  $39.7^{\circ}$ , and the warmest month is July, with a mean temperature of  $69.4^{\circ}$ . The highest temperature recorded is  $94^{\circ}$ , on July 1, 1891, and the lowest  $13^{\circ}$ , on February 4, 1899.

Rain falls in every month of the year, but in July and August the showers are light and infrequent. The mean annual precipitation is 32 inches, which, it is interesting to notice, is more than double that of San Jose, where the mean, based upon records covering twenty-six years, is but 14.88 inches. The ratio of the rainfall on the mountain to that in the valley appears to be fairly constant for all months in the year. December is the month of heaviest precipitation on the mountain. More than half of the annual rainfall occurs in the four months of December, January, February, and March. The annual precipitation has exceeded 30 inches during eight years of the twenty, and has fallen below 20 inches during two years. These dry years were 1885, when the rainfall amounted to but 18.23 inches, and the memorable 1898, when but 17.11 inches fell. The years of maximum rainfall were 1884, when 90.12 inches fell, and 1894, when 44.49 inches fell.

## MAXIMUM TEMPERATURES (DEGREES FAHRENHEIT).

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec.
1889 .....	60	70	64	74	82	84	92	92	86	84	68	46
1890 .....	55	61	60	71	80	82	90	88	84	81	77	68
1891 .....	61	49	59	72	77	89	94	92	85	77	71	60
1892 .....	60	58	66	62	84	84	84	91	88	79	88	64
1893 .....	72	74	62	65	72	78	87	87	78	72	67	65
1894 .....	53	54	64	72	72	79	86	92	85	79	77	50
1895 .....	58	64	64	74	79	90	85	91	83	81	80	67
1896 .....	65	67	66	55	83	85	91	84	82	82	67	63
1897 .....	59	60	53	73	75	83	89	91	80	70	70	71
1898 .....	62	65	60	76	73	85	90	91	86	76	75	57
1899 .....	65	61	68	73	75	85	91	80	91	75	61	72
1900 .....	63	58	67	66	74	83	86	86	78	77	74	72
Absolute maximum and year .....	72 1893	74 1893	68 1899	76 1898	84 1892	90 1895	94 1891	92 a 1889	91 1899	84 1889	88 1892	72 a 1899

a Also other years.

## CLIMATE OF SANTA CLARA VALLEY.

121

## MINIMUM TEMPERATURES (DEGREES FAHRENHEIT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1889.....	27	22	31	30	32	46	50	51	44	34	30	24
1890.....	17	18	25	31	30	32	49	54	46	32	30	29
1891.....	26	21	26	29	32	31	36	45	33	33	33	17
1892.....	29	25	26	26	28	33	51	50	44	30	27	22
1893.....	25	22	23	25	34	35	41	56	36	33	26	26
1894.....	17	16	20	25	27	31	56	55	35	33	34	28
1895.....	23	32	22	24	31	35	41	49	35	41	28	23
1896.....	27	25	18	24	27	34	48	44	38	33	18	28
1897.....	26	21	19	28	33	36	55	48	39	33	29	22
1898.....	17	27	21	27	33	33	50	52	34	32	28	22
1899.....	24	13	25	26	26	35	56	41	43	31	32	27
1900.....	30	24	31	28	30	42	51	44	38	31	30	23
Absolute minimum and year.....	17 α 1890	13 1899	18 1896	24 α 1895	26 1899	31 α 1891	36 1891	41 1899	38 1891	30 1892	18 1896	17 1891

α Also other years.

## MONTHLY AND ANNUAL MEAN TEMPERATURE (DEGREES FAHRENHEIT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1889.....	39.5	43.9	44.8	50.3	52.8	67.4	70.7	70.4	66.9	50.5	43.5	35.2	53.4
1890.....	30.2	36.8	40.5	47.6	54.5	57.6	59.8	68.9	65.9	58.1	55.5	45.7	51.8
1891.....	41.6	35.0	41.0	44.3	51.4	55.5	70.9	71.5	60.7	58.7	51.8	35.8	51.5
1892.....	43.6	41.7	42.6	42.3	52.6	57.3	66.9	70.8	62.1	53.2	49.7	39.8	51.9
1893.....	36.0	37.7	37.3	40.5	51.9	58.8	67.9	71.8	55.4	51.0	47.0	45.0	50.0
1894.....	35.9	35.6	40.4	49.4	51.6	52.6	71.3	71.4	63.5	55.5	57.5	37.2	51.8
1895.....	36.4	45.6	42.8	47.2	52.2	65.2	67.2	70.4	59.0	59.9	47.9	41.4	52.9
1896.....	45.2	46.5	43.4	37.6	46.6	64.6	73.2	67.8	61.7	57.8	44.7	45.4	52.9
1897.....	42.1	36.4	32.6	51.0	58.0	57.8	70.8	71.5	59.4	45.9	45.3	42.9	51.2
1898.....	35.7	42.8	39.1	50.8	47.9	62.0	71.4	71.2	61.8	56.0	46.5	43.8	52.4
1899.....	42.5	41.0	39.6	47.6	46.3	63.7	71.6	61.3	69.8	50.2	46.9	45.6	52.2
1900.....	47.5	43.0	48.1	43.0	52.9	63.8	71.6	62.1	56.3	51.6	51.1	47.2	58.2
Mean (12 years) .....	39.7	40.5	41.0	46.0	51.6	60.5	69.4	69.1	61.9	54.0	49.4	42.0	52.1

## MONTHLY AND ANNUAL PRECIPITATION (INCHES AND HUNDREDTHS).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1881.....	3.51	5.99	1.13	0.98	0.09	0.33	0.00	0.00	0.10	0.33	0.91	9.72	23.09
1882.....	3.55	2.90	5.40	4.70	0.48	1.06	0.00	0.00	0.00	6.16	3.45	1.93	29.63
1883.....	3.10	3.75	3.66	2.06	7.55	0.00	0.00	0.00	0.65	2.15	1.48	2.05	32.05
1884.....	5.60	12.76	16.35	11.96	1.24	3.85	0.00	0.15	0.65	3.71	0.01	33.84	90.12
1885.....	1.99	0.57	1.15	2.08	0.16	0.36	0.00	0.00	0.15	0.05	1.92	9.80	13.23
1886.....	4.40	1.80	5.77	6.79	0.70	0.00	0.00	0.00	0.00	0.60	2.32	2.34	25.22
1887.....	2.83	7.80	1.39	5.75	0.25	0.30	0.04	0.00	0.33	0.09	0.90	11.25	30.93
1888.....	10.04	1.38	3.40	0.68	1.25	0.67	0.00	0.02	0.49	0.03	3.27	4.23	25.46
1889.....	1.04	1.42	6.17	1.92	3.21	0.05	0.00	0.00	0.00	4.38	4.46	13.19	35.84
1890.....	7.93	6.60	4.39	1.79	2.42	0.00	0.00	0.00	0.80	0.02	0.58	5.39	29.92
1891.....	1.38	7.12	4.10	3.08	1.01	0.57	0.00	0.00	0.28	0.61	0.38	9.54	23.07
1892.....	1.97	2.99	5.98	1.90	3.52	0.32	0.00	T.	0.24	1.33	10.30	5.56	34.16
1893.....	3.29	3.45	8.99	3.61	0.95	0.16	0.00	0.00	0.48	0.66	4.01	3.58	29.18
1894.....	9.74	10.52	2.54	0.89	2.78	0.64	0.02	T.	1.64	2.98	0.84	11.90	44.49
1895.....	10.00	3.08	1.46	2.30	2.39	0.00	0.01	0.00	0.08	0.78	2.46	3.16	25.72
1896.....	9.54	1.08	3.83	6.70	2.10	0.02	T.	0.28	0.47	1.85	5.86	4.91	36.64
1897.....	3.50	7.42	6.45	0.82	0.28	0.38	0.00	0.00	0.07	1.25	1.51	2.70	24.38
1898.....	2.30	4.16	2.04	0.84	2.41	0.88	0.00	0.00	0.29	1.33	1.23	2.13	17.11
1899.....	5.63	0.75	11.11	1.40	1.47	0.39	0.00	0.12	T.	6.37	4.92	4.16	36.32
1900.....	3.26	1.70	3.37	4.06	1.35	T.	0.01	0.02	0.08	3.48	7.76	2.21	27.30
Average (20 years) .....	4.73	4.36	5.18	3.25	1.78	0.47	T.	0.03	0.34	1.91	2.95	7.13	32.19

## CLIMATOLOGY OF CALIFORNIA.

## MEAN RELATIVE HUMIDITY (PER CENT)

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1891. . . . .	61 1	91 2	77 7	77 2	62 0	65 8	57 4	61 0	66.7	55.6	56 8	83 4
1892. . . . .	60 8	.. .	.. .	.. .	.. .	.. .	47 9	44 7	57 8	64 4	62 3	72 7
1893. . . . .	52 4	76 9	87 4	78 4	57 1	48 8	46 3	54 5	81 1	84 9	67 6	65 3
1894. . . . .	79 2	80 7	72 3	56 8	72 8	67 9	41 9	33.1	48 8	61 7	48 2	87 4
1895. . . . .	82 2	59 8	78 0	64 5	58 5	37 1	44 6	55 7	50 2	53 0	58 0	65 2
1896. . . . .	72 2	52 7	78 3	84 2	70 7	39 9	38 1	42 1	52 5	52 7	69 1	66 6
1897. . . . .	70 5	88 3	90 9	53 9	51 4	56 7	31 0	36 8	51 9	61 3	63 9	62 8
1898. . . . .	77 9	72 7	74 1	54 7	67 6	57 5	30 3	38 2	53.2	57 6	57 3	56 3
1899. . . . .	70 6	61 4	83.2	64 8	66 7	45 4	33 9	54 0	40 2	67 8	78 6	67 4
1900. . . . .	66 1	68 5	78 0	76 9	65 5	49 7	39 9	.. .	.. .	.. .	.. .	.. .
Mean. . . . .	69 3	72 5	78 9	67 4	63 6	52 1	41 1	46.7	55.8	62 1	62 4	69 7

Highest monthly mean humidity 91 2, February, 1891

Lowest monthly mean humidity 30 3, July, 1898

## TOTAL MONTHLY WIND MOVEMENT (MILES)

1895. . . . .	9,581	9,766	.. .	.. .	12,098	9,260	7,837	6,519	6,881	4,974	11,550	10,823
1896. . . . .	14,758	10,042	8,085	9,987	9,655	10,350	8,102	6,705	6,195	9,229	9,541	12,183
1897. . . . .	9,247	8,139	9,796	9,888	12,011	10,495	7,860	6,333	6,865	10,238	9,997	9,832
1898. . . . .	11,309	9,321	8,824	10,105	8,635	.. .	.. .	7,386	6,976	8,838	12,068	11,838
1899. . . . .	13,662	12,772	11,068	10,166	11,703	8,644	8,083	7,604	7,493	10,390	8,500	12,286
1900. . . . .	10,682	11,178	8,811	10,953	10,644	8,106	7,086	6,856	7,215	8,084	7,296	10,002
Average. . . . .	11,565	10,202	9,307	10,219	10,791	9,371	7,784	6,900	6,988	8,617	9,825	11,152

<sup>a</sup>Seven days' record missing (15th to 21st)

NOTE—November 16-17, 1898, maximum hourly velocity, 80 miles, velocity of gusts probably over 100 miles January 15, 1895, highest hourly velocity (estimated), 80 to 90 miles

## LOCAL CLIMATOLOGY.

### APTOS.

[Data from records of Southern Pacific Railway Company.]

Aptos is situated in Santa Cruz County, on Monterey Bay, about 7 miles southeast of the city of Santa Cruz, in latitude  $36^{\circ} 58'$  north, longitude  $121^{\circ} 54'$  west; elevation 102 feet above sea level.

The mean annual temperature, based upon records covering sixteen years, is  $56^{\circ}$ , which is practically the same as that of San Francisco, and  $2.4^{\circ}$  lower than the annual mean at Santa Cruz. June, July, and August are the warmest months, with mean temperatures of  $62.5^{\circ}$ ,  $62.3^{\circ}$ , and  $61.4^{\circ}$ , respectively; September is also a warm month, with a mean of  $60.9^{\circ}$ . The coldest month is January, with a mean of  $48.5^{\circ}$ ; the means for February and December are nearly the same. The maximum seldom exceeds  $90^{\circ}$ , the highest recorded in recent years being  $91^{\circ}$ , in June, 1898. Minimum temperatures of  $26^{\circ}$  are recorded in January, 1898, December, 1900, and February, 1901.

The average annual precipitation during the past sixteen years is 25.63 inches, about 1 inch less than that of Santa Cruz. The greatest precipitation occurs in December and January, but heavy rains also fall in November, February, and March. The rainfall during June, July, August, and September is very light and infrequent. During the month of December, 1889, the rainfall was 18.29 inches, and the total of that year was 37.94 inches.

MONTHLY AND ANNUAL MEAN TEMPERATURE (DEGREES FAHRENHEIT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1885.....	49.2	51.1	55.4	57.7	61.7	65.4	64.9	63.5	60.2	59.3	56.0	53.7	58.2
1886.....	51.0	54.8	52.3	56.6	59.3	58.9	61.4	61.9	60.9	55.1	51.6	53.1	56.4
1887.....	49.1	47.0	55.5	55.7	58.9	63.4	61.0	60.1	60.1	59.6	54.5	49.2	56.2
1888.....	46.0	51.9	53.0	58.4	59.7	67.9	65.9	63.2	61.8	59.1	53.9	54.1	57.9
1889.....	48.6	51.6	56.6	59.7	59.6	62.5	63.4	61.9	62.9	60.7	56.8	52.3	58.0
1890.....	46.2	49.0	53.6	56.2	61.0	61.9	62.0	62.6	61.2	59.3	55.0	54.4	56.9
1891.....	49.1	49.7	58.9	55.5	57.9	63.5	62.3	62.6	62.4	57.3	55.2	47.8	56.5
1892.....	50.9	52.8	53.8	55.4	61.3	63.2	69.2	63.4	60.7	58.3	53.0	50.2	57.7
1893.....	51.1	47.4	51.8	51.6	58.8	59.5	59.5	60.7	60.5	57.3	54.5	52.4	55.4
1894.....	45.6	43.2	52.1	55.8	57.1	61.9	63.9	64.3	63.1	56.0	51.1	46.9	55.5
1895.....	44.8	47.8	48.4	50.0	55.1	56.5	57.9	56.8	66.0	57.5	51.3	44.0	53.0
1896.....	44.9	47.9	47.0	52.3	54.6	60.2	62.7	60.3	54.0	52.7	45.8	44.6	52.3
1897.....	42.0	45.1	47.9	61.1	63.4	72.7	63.6	60.8	64.1	59.5	51.1	43.1	56.6
1898.....	56.8	43.7	50.4	44.9	55.4	62.6	60.9	59.8	58.8	58.1	50.8	44.9	54.4
1899.....	51.3	47.4	51.6	56.2	55.0	59.9	53.9	60.3	58.0	54.3	53.0	49.7	54.7
1900.....	48.8	51.5	54.2	51.9	61.9	59.6	59.0	60.7	60.2	59.6	55.2	49.3	55.7
Mean (16 years) .....	48.5	49.5	52.3	54.9	58.8	62.5	62.3	61.4	60.9	57.8	53.0	49.7	56.0

## MONTHLY AND ANNUAL PRECIPITATION (INCHES AND HUNDREDTHS)

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1885. ....	2 86	0 19	0 43	1 78	0 13	0 00	0 18	0 00	0 07	0 02	10 65	3 83	20 14
1886. ....	7 61	0 80	4 09	7 10	0 27	0 00	0 00	0 00	0 00	0 70	0 84	1 53	22 94
1887. ....	0 95	8 82	0 76	1 61	0 19	0 00	0 00	0 00	0 47	0 05	1 11	3 72	17 68
1888. ..	5 85	1 59	5 32	9 50	0 79	0 25	0 00	0 00	0 45	0 00	5 75	4 31	24 81
1889. ....	0 50	0 87	5 90	0 85	1 71	0 00	0 00	0 00	0 00	7 49	2 33	18 29	37 94
1890. ....	10 29	4 60	3 16	1 25	1 66	0 00	0 00	0 00	0 40	9 40	0 28	2 93	24 97
1891. ....	1 08	13 16	3 01	2 84	0 20	0 00	0 00	0 00	1 00	0 07	0 27	7 64	29 27
1892. ....	0 92	4 90	2 67	1 95	2 47	0 00	0 00	0 00	0 65	1 36	3 06	8 72	27 30
1893. ....	3 40	3 41	7 97	1 54	0 42	0 00	0 00	0 00	0 22	0 33	3 16	3 48	23 93
1894. ....	7 56	6 05	0 92	0 89	2 50	0 24	0 00	0 00	2 00	2 98	0 71	13 32	37 12
1895. ....	11 80	2 95	2 85	1 88	1 39	0 00	0 00	0 00	0 00	0 15	1 53	2 31	24 86
1896. ....	9 63	0 00	2 90	5 01	1 59	0 00	0 00	0 76	0 26	1 64	5 92	4 49	32 20
1897. ....	1 28	6 27	4 03	0 00	0 30	0 10	0 00	0 00	0 00	1 69	0 82	1 39	15 88
1898. ....	1 23	3 52	1 17	0 32	1 17	0 20	0 00	0 00	1 40	0 76	0 75	1 84	12 36
1899. ....	6 43	0 22	13 14	1 25	1 00	0 00	0 00	0 00	0 00	6 01	4 24	4 36	36 65
1900. ....	4 56	0 53	2 19	1 53	0 59	0 00	0 00	0 00	0 27	1 58	8 95	1 82	22 02
Average (16 years) . .	4 75	3 82	3 78	1 89	1 02	0 05	0 01	0 05	0 45	1 57	3 19	5 25	25 63

## AUBURN.

Auburn is the county seat of Placer County, a narrow county in the central eastern portion of California, extending from Lake Tahoe and the Nevada line westward to Sutter County and the southern portion of Nevada County, and is situated in latitude  $38^{\circ} 54'$  north, longitude  $121^{\circ} 50'$  west, a short distance southwest of the junction of the middle and north forks of the American River. The elevation is 1,360 feet, with the land sloping eastward to the American River, where the elevation of the channel is about 500 feet. The Sierra Nevada Mountains, running through the eastern portion of the county, reach an elevation of 7,000 feet. The foothills are excellent fruit-growing districts.

The general movement of the air is from the north, northwest, and northeast. The date of the last killing frost in the spring of 1899 was May 2, and the first in autumn, 1899, was October 15. The mean annual temperature, based upon records covering a period of twenty-nine years, is  $60.1^{\circ}$ . The coldest month is January, with a mean temperature of  $45.5^{\circ}$ , and the warmest is July, with a mean temperature of  $76.7^{\circ}$ . During the months of June, July, August, and September the mean temperature exceeds  $70^{\circ}$ .

The highest temperature recorded within a period of twenty-two years was  $110^{\circ}$ , which occurred during the months of July and August, 1898. The lowest temperature recorded was  $12^{\circ}$ , in January, 1888. Reliable frost data are not available.

The mean annual rainfall for twenty-nine years is 33.58 inches. Two-thirds of this rainfall occurs between December and April. Rain seldom falls during July or August. The rainfall has exceeded 40 inches during six years of the twenty-nine, and in 1884 exceeded 50 inches. There have been but two years in the past twenty-nine when the rainfall did not reach 20 inches, viz., 1877, when but 18.07 inches fell, and 1898, when 19.96 inches fell.



## MAXIMUM TEMPERATURE (DEGREES FAHRENHEIT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1878.....	64	66	72	80	88	94	.....	99	94	87	76	70
1879.....	60	.....	80	81	83	92	98	100	97	86	78	65
1880.....	69	65	72	81	86	89	97	95	94	86	74	60
1881.....	69	72	79	79	85	92	99	93	94	78	70	59
1882.....	58	60	79	82	92	92	98	103	98	77	.....	70
1883.....	62	84	76	72	90	100	100	99	95	79	72	69
1884.....	65	78	70	78	84	88	95	98	93	82	76	71
1885.....	65	69	77	80	95	90	96	103	97	98	78	67
1886.....	63	72	72	78	89	95	101	101	96	81	69	64
1887.....	65	69	78	87	100	106	100	98	98	94	77	70
1888.....	64	77	76	89	86	94	101	105	103	91	74	69
1889.....	64	76	79	83	89	93	105	101	98	95	80	53
1890.....	59	70	72	81	99	98	105	98	94	87	84	60
1891.....	69	62	74	82	89	108	108	105	98	98	82	65
1892.....	74	70	87	75	94	94	96	105	94	90	80	80
1893.....	76	77	80	78	90	95	103	102	90	87	78	79
1894.....	75	75	84	85	90	95	104	106	97	90	82	72
1895.....	66	80	81	85	89	104	102	105	93	94	95	73
1896.....	77	85	79	72	92	.....	104	95	92	90	68	74
1897.....	76	70	73	87	94	95	104	104	88	87	75	77
1898.....	69	72	70	89	82	93	110	110	98	85	80	75
1899.....	85	82	88	82	85	101	102	93	98	88	75	59
Absolute maximum and year.....	{ 85 1899	{ 85 1896	{ 88 1899	{ 89 a 1888	{ 100 1887	{ 108 1891	{ 110 1898	{ 110 1898	{ 103 1888	{ 98 1891	{ 95 1895	{ 80 1892

a Also 1898.

## MINIMUM TEMPERATURE (DEGREES FAHRENHEIT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1878.....	26	31	32	34	49	54	.....	54	48	45	36	27
1879.....	25	.....	36	45	43	50	54	56	54	44	32	18
1880.....	23	28	30	36	36	50	62	55	50	46	26	35
1881.....	28	33	32	42	50	52	54	50	52	40	27	30
1882.....	23	25	23	33	43	48	63	60	48	32	.....	25
1883.....	18	20	39	32	41	53	61	54	52	42	32	29
1884.....	31	20	23	40	50	50	54	56	48	40	39	23
1885.....	30	31	40	38	45	51	56	58	54	50	38	29
1886.....	25	35	28	40	46	60	58	58	58	32	30	31
1887.....	27	24	36	36	40	50	57	52	38	48	30	30
1888.....	12	28	33	42	46	52	54	54	54	46	35	32
1889.....	27	32	38	43	46	55	56	59	46	45	40	37
1890.....	26	24	34	45	45	34	54	55	52	40	38	35
1891.....	32	32	36	42	47	52	54	56	50	44	41	28
1892.....	35	35	38	41	45	53	60	58	57	44	35	34
1893.....	33	29	34	39	47	53	59	43	53	43	39	35
1894.....	25	29	29	40	43	53	62	60	50	50	40	33
1895.....	30	36	32	35	45	50	56	55	49	47	37	25
1896.....	31	37	27	38	44	.....	58	58	55	47	30	36
1897.....	38	30	30	41	50	45	59	60	42	37	25	20
1898.....	26	37	30	40	46	49	57	63	54	44	34	30
1899.....	32	25	35	43	49	52	65	62	60	42	39	33
Absolute minimum and year.....	{ 12 1888	{ 20 a 1883	{ 23 a 1882	{ 32 1883	{ 36 1880	{ 34 1890	{ 54 b 1879	{ 48 1893	{ 38 1887	{ 32 c 1882	{ 25 1897	{ 18 1879

a Also 1884.

b Several years.

c Also 1886.

CLIMATOLOGY OF CALIFORNIA.

MONTHLY AND ANNUAL MEAN TEMPERATURE (DEGREES FAHRENHEIT)

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1871.....	47 2	45 4	52 0	58 8	61 0	74 5	77 9	79 2	77 4	64 8	50 9	48 0	61 4
1872.....	45 1	48 6	51 4	58 1	63 5	69 5	75 5	75 3	69 1	63 4	51 3	45 4	59 7
1873.....	48 5	42 3	53 7	54 6	63 1	70 5	80 2	75 2	74 9	61 1	56 8	43 8	60 4
1874.....	42 4	45 9	47 2	56 3	63 3	71 5	79 6	74 0	72 9	61 7	51 3	44 5	59 2
1875.....	46 4	49 9	50 4	63 0	67 2	72 5	80 5	77 5	73 2	69 7	53 3	46 8	62 5
1876.....	44 2	49 3	51 3	57 9	65 4	77 1	75 8	73 7	70 5	62 6	53 9	49 7	61 0
1877.....	49 4	53 9	57 4	57 6	61 5	74 5	78 6	75 2	71 9	60 7	52 4	47 8	61 7
1878.....	48 2	49 1	53 2	56 4	63 0	72 6	74 9	75 1	68 5	62 7	54 1	46 1	60 3
1879.....	43 0	52 0	53 9	57 2	57 9	69 8	73 9	77 1	70 6	60 4	50 6	43 5	59 2
1880.....	43 1	44 7	45 8	51 8	60 3	68 2	76 3	72 1	71 3	62 7	47 8	47 9	57 7
1881.....	46 0	50 1	53 4	59 4	64 3	66 8	73 5	71 4	70 8	56 0	48 2	44 4	58 7
1882.....	39 8	40 1	48 2	51 0	61 7	66 7	77 5	79 0	68 6	55 3	52 5	46 6	57 2
1883.....	38 1	48 4	53 3	50 6	59 0	73 5	78 2	75 2	72 0	55 7	50 0	45 0	58 2
1884.....	45 3	43 8	48 7	51 9	62 1	63 5	72 0	76 6	64 2	58 7	53 6	45 3	57 1
1885.....	44 6	51 3	56 3	56 9	64 6	66 3	73 8	78 1	72 3	64 5	52 5	46 8	60 7
1886.....	44 0	51 9	47 8	53 4	61 5	72 4	76 7	77 5	70 5	55 2	47 9	48 1	58 9
1887.....	44 9	39 8	54 5	55 4	63 1	71 3	76 0	72 5	71 0	67 1	53 1	11 8	59 5
1888.....	40 4	50 9	51 3	61 4	61 0	66 9	76 5	76 4	76 9	64 2	52 9	47 1	60 5
1889.....	44 6	49 7	55 6	59 3	63 8	80 1	76 5	76 4	71 9	61 7	51 4	47 0	61 8
1890.....	40 8	44 0	48 7	58 6	63 6	68 5	75 4	75 1	72 2	63 3	57 3	47 1	59 6
1891.....	48 0	46 4	52 2	55 0	61 2	67 8	79 3	79 6	70 1	66 4	57 8	14 6	60 7
1892.....	50 2	52 2	55 2	56 7	64 4	68 7	75 6	76 6	71 6	61 5	58 0	51 5	62 1
1893.....	50 6	51 9	54 0	55 6	64 1	71 0	78 3	76 6	68 1	61 5	57 0	53 7	61 4
1894.....	46 5	47 8	51 7	61 6	64 3	66 2	80 5	81 9	73 9	64 7	61 2	51 3	62 6
1895.....	46 5	51 6	52 9	56 9	62 9	76 2	75 6	77 3	66 5	64 2	57 2	47 4	61 8
1896.....	53 0	52 1	54 0	51 9	60 4	70 6	80 4	72 7	68 1	65 1	51 3	54 4	61 1
1897.....	49 7	45 2	44 9	61 6	68 3	70 3	77 6	77 5	67 8	59 4	44 1	42 6	59 1
1898.....	41 4	49 5	45 8	59 1	57 6	68 1	74 1	75 8	69 2	55 4	52 8	45 0	57 1
1899.....	47 8	48 7	51 0	57 2	59 9	74 1	73 1	71 9	78 3	60 3	50 4	45 4	59 1
Mean (29 years) .....	45 5	48 1	51 6	56 5	62 6	70 7	76 7	75 9	71 1	64 6	55 0	47 0	60

MONTHLY AND ANNUAL PRECIPITATION (INCHES AND HUNDREDTHS)

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1871.....	7 21	2 36	1 85	3 57	2 06	0 00	0 00	0 00	0 00	0 54	2 80	13 55	33 9
1872.....	6 80	9 35	3 59	2 50	0 65	0 20	0 00	0 00	0 00	0 38	3 13	8 48	35 0
1873.....	3 74	7 44	0 53	1 22	0 32	0 00	0 00	0 00	0 00	0 34	1 25	11 97	26 8
1874.....	7 46	4 14	6 26	2 56	0 57	0 00	0 00	0 00	0 00	1 57	9 64	0 82	33 0
1875.....	10 00	0 44	2 73	0 10	0 61	1 82	0 00	0 00	0 00	0 85	11 39	6 05	33 9
1876.....	7 56	5 62	10 10	1 97	0 61	0 00	0 41	0 21	0 00	4 52	0 65	0 00	31 6
1877.....	6 94	1 47	2 14	0 72	1 53	0 27	0 00	0 00	0 00	0 99	2 46	1 55	18 0
1878.....	10 61	10 19	7 60	1 73	0 98	0 00	0 00	0 00	0 50	0 89	1 53	0 91	34 9
1879.....	6 34	7 16	8 78	5 94	2 43	0 46	0 00	0 00	0 00	2 38	3 82	7 88	45 1
1880.....	3 13	4 90	2 62	13 02	3 85	0 00	0 00	0 00	0 00	0 00	0 25	13 91	41 6
1881.....	9 61	8 20	2 43	1 38	0 00	1 40	0 00	0 00	0 92	2 72	3 01	5 87	35 5
1882.....	4 60	4 99	6 05	4 63	0 53	0 28	0 00	0 00	0 84	5 19	4 08	1 65	32 8
1883.....	2 86	1 06	5 19	0 70	4 07	0 00	0 00	0 00	1 70	2 51	1 00	2 52	21 6
1884.....	5 33	7 63	10 17	8 02	0 85	1 23	0 00	0 00	0 56	2 25	0 00	16 37	52 4
1885.....	1 74	1 27	0 57	2 10	0 00	0 70	0 00	0 00	0 64	0 00	15 24	4 05	26 3
1886.....	8 25	0 00	4 10	9 39	0 65	0 00	0 00	0 00	0 00	0 89	1 26	4 88	29 4
1887.....	2 04	12 38	1 50	4 34	0 30	0 00	0 00	T	1 09	0 00	1 22	4 90	27 7
1888.....	7 07	1 40	3 25	0 80	0 40	1 55	0 00	0 00	0 30	0 00	4 20	5 82	24 7
1889.....	0 33	0 52	9 57	1 36	4 65	0 00	0 00	0 00	0 00	5 75	4 85	11 94	38 6
1890.....	8 97	3 96	8 08	2 83	2 30	0 00	0 00	0 00	2 63	0 14	0 00	5 13	34 0
1891.....	0 88	6 80	5 40	2 23	0 58	0 69	0 00	0 00	0 00	1 33	0 95	7 36	28 1
1892.....	4 00	4 91	5 96	3 11	4 55	0 00	0 00	0 00	0 15	1 76	6 13	8 99	39 1
1893.....	5 33	4 74	9 20	3 71	0 78	0 00	0 00	0 00	0 70	1 11	5 32	3 88	34 1
1894.....	6 96	9 89	1 95	1 35	2 77	1 38	T	T	0 67	3 87	1 09	13 56	43 4
1895.....	12 74	4 14	3 09	3 38	1 88	0 00	T	0 13	2 04	0 12	1 04	3 39	31 6
1896.....	11 88	0 49	6 21	7 66	2 42	0 40	0 14	0 25	0 90	1 09	10 34	2 98	44 1
1897.....	2 78	11 40	8 05	1 51	0 28	0 17	0 00	T	0 20	2 83	2 22	3 50	32 1
1898.....	1 13	6 44	0 32	0 49	2 26	0 97	T	0 00	0 26	1 75	3 59	2 75	19 1
1899.....	4 78	0 17	13 25	0 51	1 28	1 43	0 00	0 08	0 00	5 94	9 00	5 47	41 1
Average (29 years) .....	5 90	4 95	5 19	8 20	1 53	0 45	0 02	0 02	0 49	1 78	3 84	6 21	33 1

## BERKELEY.

By Dr. ARMIN O. LEUSCHNER, Director of Students' Observatory.

SYNOPSIS OF METEOROLOGICAL OBSERVATIONS AT BERKELEY FOR THE YEARS ENDING JUNE 30, 1898, JUNE 30, 1899, AND JUNE 30, 1900, IN COMPARISON WITH THE TEN-YEAR SYNOPSIS, JUNE 30, 1887, TO JUNE 30, 1897.

In 1898 a ten-year synopsis of the meteorological observations taken at the Students' Observatory from 1887, July 1, to 1897, June 30, was compiled by Mr. R. Tracy Crawford, under direction of Dr. Leuschner and published in the University Chronicle, Vol. I. The ten-year synopsis is now being supplemented by a synopsis of the meteorological observations at Berkeley for the years ending June 30, 1898, June 30, 1899, and June 30, 1900, compiled by Mr. Y. Kuno.

To facilitate comparison of the annual means, etc., for these three years with the ten-year synopsis the corresponding figures of the ten-year synopsis are printed in the last column.

## ATMOSPHERIC PRESSURE.

Year ending June 30, 1898.				Year ending June 30, 1899.				Year ending June 30, 1900.				Ten years ending June 30, 1897.			
		Date.	Barom- eter read- ing.			Date.	Barom- eter read- ing.			Date.	Barom- eter read- ing.			Date.	Barom- eter read- ing.
		<i>Inches.</i>				<i>Inches.</i>				<i>Inches.</i>				<i>Inches.</i>	
Mean .....			30.049				30.051				30.028				30.027
Highest .....		December 25, 8 a. m.	30.486	December 24, 8 a. m.			30.684	December 20, 8 a. m.			30.511	December 30, 8 a. m., 1895.			30.538
Lowest .....		April 29, 8 p. m.	29.565	January 10, 8 a. m.			29.436	October 10, 8 a. m.			29.627	February 22, 8 p. m., 1891.			28.196
Annual range .....			0.921				1.198				0.884				0.970
Highest daily average.....		December 24, 28...	30.385	December 24.....			30.594	December 20 .....			30.474	December 6, 1891.. December 30, 1895. }		30.499 .	
Lowest daily average .....		April 29.....	29.602	January 10 .....			29.526	October 10.....			29.633	February 22, 1891. .		29.296	
Greatest monthly mean .....		December .....	30.211	December .....			30.220	February .....			30.142	December, 1895...		30.229	
Least monthly mean .....		June.....	29.944	August .....			29.913	July .....			29.952	August, 1887 .....		29.908	
Greatest monthly range.....		March .....	0.782	January .....			0.969	December .....			0.726	February, 1891....		1.229	
Least monthly range.....		August .....	0.293	September.....			0.225	August .....			0.246	August, 1887 .....		0.240	

## TEMPERATURE.

Year ending June 30, 1898.				Year ending June 30, 1899.		Year ending June 30, 1900.		Ten years ending June 30, 1897.	
Date.		Ther- mome- ter read- ing.	Date.		Ther- mome- ter read- ing.	Date.		Ther- mome- ter read- ing.	Ther- mome- ter read- ing.
		°F.			°F.			°F.	°F.
Mean.....		58.8			58.5			54.1	54.4
Mean temperature of the warmest day.		June 30..... 75.5	July 1..... 72.8		October 8..... 76.5	June 29, 1891..... 77.0			
Mean temperature of the coldest day.		January 10..... 36.7	February 4..... 32.8		December 28..... 38.5	January 14, 1888... 80.9			
Maximum temperature.....		June 4..... 90.8	July 1..... 94.4		October 8..... 94.0	June 29, 1891..... 101.0			
Minimum temperature.....		January 10..... 32.9	February 4..... 29.9		December 28..... 34.5	January 14, 1888... 24.9			
Annual range.....		57.9	64.5		59.5	58.9			
Greatest daily variation.....		June 30..... 37.4	July 1..... 31.2		May 11..... 33.2	June 20, 1892..... 38.1			
Least daily variation.....		March 2..... 3.5	March 23..... 2.3		January 1..... 2.5	February 19, 1892.. 1.5			
Highest monthly mean.....		June..... 60.8	September..... 58.5		June..... 59.8	August, 1891..... 62.9			
Lowest monthly mean.....		January..... 43.3	December..... 46.3		December..... 46.6	January, 1890..... 40.6			
Greatest monthly range.....		April..... 44.4	February..... 49.6		October..... 49.0	June, 1891..... 55.1			
Lowest monthly range.....		August..... 28.8	August..... 26.7		January..... 20.8	January, 1897..... 19.3			

## CLIMATOLOGY OF CALIFORNIA.

## PRECIPITATION.

	Year ending June 30, 1898		Year ending June 30, 1899		Year ending June 30, 1900		Ten years ending June 30, 1897	
	Date	Amount	Date	Amount	Date	Amount	Date	Amount
		<i>Inches</i>		<i>Inches</i>		<i>Inches</i>		<i>Inches</i>
Rainfall. . . . .		14 408		27 662		25 359		28 573
Maximum rainfall during twenty-four hours	December 7. .	2 221	March 22 ..	8 198	October 20-21...	3 198	February 15, 1891	4 160
Maximum rainfall for one month	February. ....	3 279	March... .	13 192	November . . .	5 864	December, 1894	12 634

## RELATIVE HUMIDITY

	Year ending June 30, 1898		Year ending June 30, 1899		Year ending June 30, 1900		Ten years ending June 30, 1897	
	Date	Per cent	Date	Per cent	Date	Per cent	Date	Per cent
Mean relative humidity....	.....	84 29	... ..	85 4	.. ..	87 1	.....	82 9
Maximum humidity .....	June 30, 8 p m...	100 0	(a)	100 0	July 13, 8 a m... January 3, 10, 8 a m.	100 0	January 14, 7 a m, 1888 January 15, 9 p m, 1888 March 12, 9 p m, 1889	100 0
Minimum humidity.....	October 26, 8 p m.	48 0	October 20, 8 a m.	54 8	October 8, 8 a m..	51 0	October 28, 2 p m, 1890	27 3
Annual range... ..	.....	52 0	.....	45 2	.....	49 0	.....	62 0
Greatest daily variation..	March 10, 22....	39 0	October 16. .	37 3	February 5 ...	38 5	September 24, 1891	60.2
Highest monthly mean . . .	February. ....	87 9	July . . . . .	91 5	January . . .	91 0	January, 1895. ....	89 5
Lowest monthly mean . . .	January . . . . .	80 35	February. . .	79 5	October. . . .	88 1	January, 1892 . . .	68 1
Highest monthly range . .	October. ....	46 0	...do . . . .	44 0	...do . . . . .	46 0	October, 1890 . . .	69 7
Lowest monthly range . . .	February. ....	20 0	August... .	20 5	March . . . . .	17 0	September, 1896 ..	20 0

a July 7, 9, 8 p m, August 1, 8 p m, September 1, 16, 19, 21, 8 p m, February 3, 8 a m.

## WEATHER IN GENERAL

	Number of—			Total	Foggy days	Days on which rain fell	Description of prevailing wind
	Clear days	Fair days	Cloudy days				
Year ending June 30, 1898 . . . . .	171	87	107	365	48	52	South and calm
Year ending June 30, 1899 . . . . .	124	136	105	365	49	61	Do
Year ending June 30, 1900 . . . . .	88	126	151	365	52	88	Do
Ten years ending June 30, 1897 . . . . .	175	67	123	365	66	70	Southwest

For Rainfall tables see page 168

## BOCA

[Data from records of Southern Pacific Railway Company.]

Boca is situated at the junction of the Truckee and Little Truckee rivers, in latitude 39° 25' north, longitude 120° 5' west, and has an elevation of 5,535 feet; within a short distance are elevations of from 7,000 to 8,000 feet. It is in Nevada County, on the eastern slope of the Sierra Nevada Mountains, and has essentially a mountain climate. The general movement of the air is from the north, although southwest winds blowing down the valley of the Truckee River are frequent. Killing frosts occur late in spring and early in autumn. The mean annual temperature, based upon records covering a period of thirty years, is 43.8°. The coldest month is January, with a mean temperature of 25.9° December and February are also very cold months. The warmest month is July, with a mean temperature of 62.7°. The minimum temperatures for the last four years are as follows: Zero January 9, 1897; 12° below zero December 30, 1898, 30° below zero February 6, 1899, and zero December 31, 1900. The mean annual precipitation for thirty-one years is 20.14 inches. The month of heaviest precipitation is January, with an average of 4.30 inches. The snowfall for the past four years is as follows: 1897, 193 inches; 1898, 86 inches; 1899, 224 inches; 1900, 158 inches.

## MONTHLY AND ANNUAL MEAN TEMPERATURE (DEGREES FAHRENHEIT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1871.....	29.1	30.8	39.1	42.7	52.4	61.9	70.3	68.4	58.4	48.7	35.4	33.2	49.2
1872.....	32.1	37.7	39.5	41.1	56.9	67.4	65.7	67.7	52.5	48.5	35.4	32.2	48.1
1873.....	36.0	28.9	31.3	40.4	48.9	52.0	66.9	61.3	58.1	45.3	44.6	26.8	45.0
1874.....	23.3	23.8	29.2	42.5	48.4	57.5	68.7	60.4	54.8	47.5	40.4	33.3	44.2
1875.....	30.3	30.8	36.9	43.6	57.8	54.5	65.2	64.2	48.4	50.4	35.4	35.4	46.1
1876.....	19.4	25.3	32.6	38.2	48.2	63.2	63.0	60.9	57.6	50.8	37.2	21.0	43.1
1877.....	27.9	33.1	43.0	43.2	47.8	63.2	63.5	62.1	59.1	44.3	38.8	31.1	46.4
1878.....	30.8	30.3	35.5	42.7	47.6	58.0	58.9	62.7	54.4	44.5	39.2	28.1	44.4
1879.....	20.8	33.9	38.2	43.6	44.3	57.8	61.3	62.3	57.9	42.9	34.6	24.5	43.5
1880.....	18.8	18.3	24.0	38.2	45.7	56.3	63.9	58.5	52.8	44.4	31.2	31.4	40.3
1881.....	29.1	33.9	38.3	48.7	48.6	57.2	62.9	52.4	59.3	41.5	22.7	23.9	43.2
1882.....	31.5	18.1	25.7	34.4	47.3	56.4	64.2	60.6	55.1	58.2	31.6	31.3	42.9
1883.....	22.4	18.7	40.9	51.0	47.3	56.3	60.2	56.8	58.6	41.0	32.4	29.4	42.5
1884.....	22.6	18.7	30.0	37.4	49.0	56.2	60.7	64.6	51.1	46.0	35.3	31.6	42.0
1885.....	30.2	38.8	46.9	44.6	52.4	53.5	62.9	64.2	58.7	49.9	40.5	33.1	48.0
1886.....	30.0	38.1	36.6	46.5	52.5	57.5	62.7	62.7	54.8	45.0	28.4	34.1	45.7
1887.....	27.4	21.4	34.3	42.9	51.8	56.4	64.9	63.5	55.9	49.6	33.5	22.4	43.7
1888.....	15.3	27.6	38.4	42.5	53.4	58.4	67.9	63.6	60.4	43.5	33.5	31.2	44.3
1889.....	28.1	31.3	33.6	48.2	48.6	63.9	63.9	61.9	56.8	43.5	41.7	28.8	45.7
1890.....	19.2	27.2	33.4	43.0	52.5	53.9	63.6	62.1	63.6	48.9	43.8	26.9	44.8
1891.....	25.0	28.0	34.3	41.4	50.0	56.5	66.5	63.7	54.2	48.1	40.6	20.6	44.0
1892.....	20.5	22.2	33.1	37.1	45.8	57.1	58.9	61.1	51.3	41.0	29.7	22.2	39.9
1893.....	27.4	24.4	28.6	34.5	47.1	56.1	59.9	61.5	52.5	47.9	40.0	32.1	42.7
1894.....	26.5	28.6	33.2	41.3	50.5	54.5	55.4	56.7	52.1	45.8	44.5	29.1	43.2
1895.....	26.1	29.3	32.2	38.8	52.7	57.4	60.1	57.9	51.6	48.2	38.7	31.2	43.7
1896.....	32.6	37.1	36.7	36.6	43.7	59.1	63.2	57.7	53.0	47.3	37.6	33.5	44.8
1897.....	27.8	21.8	24.1	40.9	53.7	55.3	59.3	59.5	49.2	41.3	33.4	24.4	40.9
1898.....	18.4	32.2	28.4	43.5	45.9	54.5	61.0	63.1	50.5	38.2	28.7	21.6	40.5
1899.....	25.5	26.6	31.4	37.2	40.6	54.6	56.7	50.8	51.5	37.0	36.1	23.7	39.3
1900.....	25.3	32.4	34.7	36.0	43.2	56.1	59.9	52.4	44.5	39.9	37.3	29.4	41.3
Mean (30 years).....	25.9	28.3	34.0	41.4	49.3	57.4	62.7	60.3	55.1	45.6	36.1	28.6	43.8

## MONTHLY AND ANNUAL PRECIPITATION (INCHES AND HUNDREDTHS).

1870.....	4.31	3.85	1.82	0.81	0.55	0.14	0.12	0.00	0.00	0.52	0.04	1.10	13.26
1871.....	2.50	2.32	1.60	0.45	0.00	0.10	2.00	0.00	0.00	0.00	0.60	7.30	16.87
1872.....	3.00	0.90	0.10	1.50	0.10	0.00	0.00	0.00	0.00	0.00	0.20	2.60	8.40
1873.....	1.80	4.10	0.10	0.10	0.75	0.00	0.00	0.00	0.00	0.00	0.00	4.30	11.15
1874.....	4.70	2.40	6.20	0.80	0.60	0.00	0.60	0.00	0.10	2.15	3.70	0.60	21.85
1875.....	6.30	0.00	0.65	0.60	0.00	0.40	T.	0.00	0.00	T.	1.06	1.65	10.66
1876.....	8.10	3.60	4.72	0.70	0.10	0.00	0.22	0.01	0.01	0.25	0.02	0.00	17.73
1877.....	5.22	0.00	0.46	0.95	0.38	0.10	0.00	0.00	0.00	0.00	1.50	0.30	8.89
1878.....	3.94	6.74	0.86	1.30	0.00	0.13	0.08	0.00	0.17	0.99	1.60	0.00	15.31
1879.....	5.47	2.92	4.80	2.08	0.45	0.00	0.00	0.00	0.00	0.20	0.98	4.18	21.08
1880.....	3.00	3.00	2.90	6.95	0.75	0.00	0.00	0.00	0.00	0.00	0.00	3.68	20.28
1881.....	4.31	3.75	2.90	1.48	0.00	0.00	0.00	0.00	0.00	0.10	1.20	1.00	14.74
1882.....	3.90	3.60	10.20	1.00	0.00	0.00	0.00	0.00	0.00	0.80	0.90	0.60	21.00
1883.....	1.15	2.20	1.70	0.90	1.80	0.00	0.00	0.00	0.00	2.45	0.50	0.60	11.30
1884.....	4.60	6.30	5.10	1.90	0.30	1.40	0.00	0.00	T.	0.80	0.00	8.20	28.60
1885.....	1.00	0.10	0.10	1.50	0.00	0.30	0.00	0.00	0.00	0.00	2.40	2.98	8.38
1886.....	8.35	0.85	4.40	1.30	0.50	0.00	1.00	0.00	0.10	0.70	0.70	0.70	13.60
1887.....	2.40	12.70	0.00	1.80	T.	0.00	0.00	T.	0.00	0.00	0.30	2.70	19.90
1888.....	3.75	1.00	2.40	0.10	0.51	0.10	0.15	0.30	0.12	0.00	0.95	1.45	10.83
1889.....	1.05	0.60	1.15	0.10	3.90	0.00	0.00	0.00	0.00	1.50	4.55	19.35	32.20
1890.....	14.60	5.40	5.45	0.60	0.70	0.00	0.00	0.00	0.00	0.70	0.00	3.65	31.10
1891.....	1.25	11.80	2.50	1.70	1.40	0.25	0.05	0.00	0.60	0.00	0.25	8.30	23.10
1892.....	0.70	3.35	1.70	2.70	3.10	0.70	0.00	0.00	0.00	1.50	8.35	6.95	23.05
1893.....	4.55	8.90	4.00	1.90	1.35	0.00	0.00	0.05	0.55	0.25	2.42	3.70	27.67
1894.....	5.10	7.55	0.75	1.00	0.33	T.	0.00	T.	T.	0.61	0.50	11.80	27.64
1895.....	8.36	1.20	0.45	0.70	0.90	T.	0.00	T.	0.97	0.11	0.71	3.07	16.47
1896.....	7.75	0.50	6.30	6.65	3.10	0.25	1.15	0.13	0.35	0.00	2.47	1.80	30.50
1897.....	2.20	6.35	8.35	0.10	0.50	0.40	0.00	0.50	T.	2.10	2.30	2.72	26.02
1898.....	1.55	2.90	2.50	1.30	0.85	1.00	0.00	0.00	0.01	1.28	1.84	1.58	14.31
1899.....	6.80	1.85	7.95	0.85	2.40	0.10	0.00	0.98	0.00	4.42	2.59	4.58	32.47
1900.....	1.57	0.60	3.52	4.27	1.10	2.67	T.	1.22	0.66	3.04	5.73	4.58	28.96
Average (31 years).....	4.30	3.59	3.08	1.55	0.85	0.26	0.17	0.10	0.12	0.79	1.58	3.74	20.14

## CHICO

Chico is situated about 5 miles east of the Sacramento River, in the northern central portion of the valley, latitude  $39^{\circ} 43'$ , longitude  $121^{\circ} 51'$ . The lower foothills of the Sierra Nevada Mountains lie close to the east. While the elevation of Chico itself is but 193 feet, 10 miles east the contours approximate 1,000 feet, and 20 miles east elevations of several thousand feet are reached. The Sierra Nevada Mountains are not quite as abrupt and lofty here as elsewhere in the range. The general drainage of the air is down the main axis of the valley, that is, from the northwest; but there must also be a considerable movement of air from the northeast and east, backward over the mountains, with the passage of certain high areas eastward.

The mean annual temperature, based upon records extending over a period of thirty years, is  $63.8^{\circ}$ . The coldest month is January, with a mean temperature of  $46.7^{\circ}$ , and the warmest is July,  $83.9^{\circ}$ .

The highest temperature recorded within this period of thirty years was  $117^{\circ}$ . Temperatures exceeding  $100^{\circ}$  are not infrequent during June, July, and August. The lowest temperature was  $18^{\circ}$ , or an absolute range of  $99^{\circ}$ . The lowest temperature recorded in April was  $36^{\circ}$ , and in May  $40^{\circ}$ . The first killing frost in autumn last year (1899) occurred on December 12 and the last killing frost in spring on March 30.

The mean annual rainfall for twenty-nine years is 22.44 inches. More than half of this amount falls in the three months of December, January, and February. July is practically a rainless month, as only thrice in twenty-nine years has rain fallen to an appreciable extent. The rainfall is well distributed for agricultural purposes. During twelve of the twenty-nine years the total annual rainfall has not equaled 20 inches, but only twice has the rainfall not exceeded 15 inches. The driest year was that of 1898, when but 12.31 inches fell. The year of greatest rainfall was 1892, when over 36 inches fell.

MAXIMUM TEMPERATURE (DEGREES FAHRENHEIT)

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1878.. .. .	65	65	78	82	..	105	105	111	98	90	78	68
1879.. .. .	62	74	82	84	95	104	106	108	105	92	78	62
1880.. .. .	64	65	76	86	92	96	106	102	102	92	75	68
1881.. .. .	..	74	87	92	94	108	106	102	106	86	78	62
1882.. .. .	58	60	86	94	105	106	112	110	102	84	68	68
1883.. .. .	..	80	84	84	100	108	110	108	107	88	75	68
1884.. .. .	60	78	78	85	85	97	105	111	95	78	75	74
1885.. .. .	68	75	86	96	104	100	107	115	105	103	75	68
1886.. .. .	66	80	76	89	100	106	114	109	105	90	84	76
1887.. .. .	69	70	80	87	107	113	114	110	105	95	80	62
1888.. .. .	62	80	80	95	98	100	110	111	109	90	73	64
1889.. .. .	66	78	80	86	104	106	114	115	103	98	75	60
1890.. .. .	59	66	72	86	98	104	111	104	92	92	88	70
1891.. .. .	72	68	78	90	98	114	117	116	99	91	78	68
1892.. .. .	70	76	84	84	98	104	105	110	98	95	88	72
1893.. .. .	68	72	78	80	92	96	105	108	98	90	83	78
1894.. .. .	64	70	78	88	92	102	105	110	106	96	90	66
1895.. .. .	66	78	80	92	98	108	108	110	98	94	80	68
1896.. .. .	64	75	78	78	94	100	108	104	105	94	76	67
1897.. .. .	62	74	75	92	98	109	108	112	100	85	78	69
1898.. .. .	66	76	78	97	98	104	114	112	100	90	85	70
1899.. .. .	78	84	77	90	92	107	107	103	105	102	76	78
Absolute maximum and year	78 1899	84 1899	87 1881	97 1898	107 1887	114 1891	117 1891	116 1891	109 1888	103 1885	90 1894	78 1893

## MINIMUM TEMPERATURE (DEGREES FAHRENHEIT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1878.....	28	38	39	38	.....	64	58	60	52	42	34	24
1879.....	28	30	43	48	46	56	60	62	60	48	34	26
1880.....	26	28	34	42	46	60	68	62	60	52	22	40
1881.....	.....	46	42	54	56	66	62	68	56	36	28	32
1882.....	30	30	36	46	50	60	70	70	54	54	28	34
1883.....	.....	26	46	47	46	60	74	70	62	40	30	30
1884.....	30	20	34	48	56	54	67	65	50	48	35	25
1885.....	35	35	45	48	50	58	65	64	58	46	39	33
1886.....	29	40	38	44	50	66	68	69	55	37	33	33
1887.....	30	28	40	48	50	52	75	52	54	45	30	32
1888.....	18	35	40	45	55	60	65	67	60	45	37	35
1889.....	81	27	45	48	48	60	65	65	53	50	40	32
1890.....	28	28	36	46	50	53	60	60	56	47	40	33
1891.....	31	30	38	44	53	50	60	65	58	55	38	20
1892.....	32	32	32	38	42	50	56	58	53	38	32	32
1893.....	32	30	34	36	42	52	60	58	45	40	32	30
1894.....	24	28	28	36	42	48	62	60	46	42	33	31
1895.....	33	36	40	40	54	55	64	58	50	42	30	28
1896.....	29	32	30	36	40	52	58	58	52	44	26	35
1897.....	35	30	33	41	53	58	65	58	55	42	34	28
1898.....	25	36	32	45	52	55	65	64	55	45	35	28
1899.....	30	25	35	45	45	57	60	59	58	44	45	34
Absolute minimum and year.....	18	20	28	36	40	48	56	52	45	36	22	20
	1888	1884	1894	1893	1896	1894	1892	1887	1893	1881	1880	1891

α Also 1894 and 1896.

## MONTHLY AND ANNUAL MEAN TEMPERATURE (DEGREES FAHRENHEIT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1870.....	47.8	50.9	51.3	60.1	67.4	76.3	85.8	81.6	71.7	62.6	53.8	44.6	62.8
1871.....	47.9	47.7	54.9	59.4	65.2	79.2	82.3	82.9	72.3	61.5	51.6	47.4	62.7
1872.....	46.9	51.9	55.6	59.1	71.3	77.0	89.1	77.7	73.1	63.5	50.4	46.5	63.5
1873.....	50.1	46.2	57.5	60.2	69.9	77.2	84.2	75.3	75.5	61.8	52.8	38.8	62.5
1874.....	43.2	45.9	50.0	58.7	66.6	73.9	80.3	74.9	71.4	60.7	51.1	42.9	60.0
1875.....	42.5	48.4	52.5	66.3	71.1	72.3	81.8	83.6	76.8	71.4	45.6	48.4	63.4
1876.....	44.9	48.4	52.6	61.8	65.7	79.9	74.5	73.6	75.1	70.8	55.6	47.8	62.6
1877.....	50.2	53.7	60.5	60.8	67.1	79.5	82.8	80.2	75.1	63.6	52.6	42.3	64.0
1878.....	49.6	51.3	57.6	65.6	70.8	83.3	85.4	85.8	74.3	66.1	56.0	46.0	66.0
1879.....	45.0	54.4	58.7	62.9	61.5	78.5	80.3	83.5	78.5	64.1	51.6	44.3	63.6
1880.....	44.6	45.4	54.0	57.6	65.7	75.7	85.2	80.8	78.9	76.1	48.1	49.5	63.5
1881.....	49.6	56.3	59.0	69.3	73.9	78.5	82.6	82.6	78.2	57.3	58.2	46.6	66.4
1882.....	43.0	45.1	56.8	61.2	68.8	79.5	85.5	85.8	76.6	64.9	46.4	50.8	63.7
1883.....	46.5	49.7	60.8	60.4	68.4	87.5	91.1	86.7	79.2	61.3	51.1	45.5	65.7
1884.....	46.6	44.4	53.8	60.7	71.2	70.2	84.1	86.7	69.1	58.4	57.5	50.6	62.8
1885.....	49.4	54.5	63.9	65.1	73.9	76.5	84.4	88.3	76.1	70.8	54.9	51.4	67.4
1886.....	48.5	57.1	54.7	60.2	70.5	84.0	89.0	85.1	77.9	62.5	52.9	52.6	66.2
1887.....	50.5	45.0	60.0	65.0	72.7	80.6	88.3	80.1	77.7	70.5	55.0	48.5	66.2
1888.....	42.6	54.9	56.4	70.9	71.6	75.1	86.0	82.1	83.0	67.2	54.7	51.4	66.3
1889.....	45.3	51.4	58.9	64.2	69.7	82.6	85.2	85.1	77.9	64.2	54.7	48.1	65.6
1890.....	42.1	46.3	51.5	61.3	68.7	71.3	80.4	79.5	70.9	63.7	57.2	45.5	61.5
1891.....	50.0	48.5	55.1	60.9	67.9	77.5	87.5	85.6	75.4	71.1	57.8	43.9	65.1
1892.....	47.1	49.6	53.2	56.2	64.6	70.9	77.1	76.7	72.8	65.8	58.5	52.5	62.1
1893.....	45.8	49.3	49.6	53.4	64.8	71.0	77.1	78.5	64.7	59.3	52.8	48.8	59.6
1894.....	44.8	46.2	52.7	60.1	63.9	63.2	81.3	79.5	71.3	64.0	58.5	48.6	61.2
1895.....	48.8	55.6	57.0	62.2	68.4	80.4	81.4	82.8	68.8	65.6	52.2	45.3	64.0
1896.....	49.3	53.1	55.0	53.4	62.2	77.6	84.9	78.6	71.6	65.4	52.7	52.0	63.0
1897.....	47.3	50.4	52.0	65.2	74.8	77.7	85.1	83.5	73.2	61.6	55.7	48.4	64.5
1898.....	42.4	53.2	54.0	64.7	65.6	77.1	85.2	85.3	75.0	65.5	53.6	46.0	64.0
1899.....	49.6	52.6	53.4	63.2	65.6	78.2	84.6	73.2	76.8	63.3	57.8	48.0	63.9
1900.....	51.0	53.2	59.9	59.4	69.3	78.7	82.6	79.2	72.6	59.9	57.0	47.9	64.2
Mean (31 years).....	46.9	50.3	55.6	61.6	68.4	77.1	83.9	81.5	74.6	64.6	53.8	47.5	63.8

## CLIMATOLOGY OF CALIFORNIA.

## MONTHLY AND ANNUAL PRECIPITATION (INCHES AND HUNDREDTHS)

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1871..	2 36	3 53	1 17	2 13	1 12	0 00	0 00	0 00	0 00	0 09	2.07	10 11	22 58
1872..	7 94	8 12	1 02	1 64	0 00	0 33	0 00	0 05	0 00	0 20	2.11	5 07	26 48
1873..	2 51	2 04	1 50	1 08	0 03	0 00	0 00	0 00	0 00	0 65	2.16	9 36	19 38
1874..	5 16	2 94	2 21	1 90	0 92	0 00	0 00	0 00	0 00	4 60	5.96	0 65	21 34
1875..	4 77	0 38	0 86	T	0 18	1 36	0 00	0 00	0 00	0 57	5.08	2 21	15 41
1876..	4 76	7 49	4 59	0 00	T	T	0 50	0 00	0 14	4 03	0 35	0 00	21 86
1877....	5 70	2 04	2 64	0 81	0 33	0 28	0 00	0 00	0 00	1 44	2.49	2 31	17 54
1878..	12 04	10 01	4 49	1 52	0 42	0 00	0 00	T	0 54	0 96	1.11	0 27	31 36
1879..	3 70	4 93	3 62	2 17	2 05	0 12	T	0 20	0 00	0 42	3.08	4 70	25 05
1880..	1 14	0 95	0 47	5 78	0 75	0 00	0 00	0 00	0 00	0 00	0 00	8 29	17 38
1881..	4 36	3 94	1 03	0 00	0 00	0 00	0 00	0 00	1 13	0 00	1.55	2 55	14 56
1882..	1 61	4 54	4 54	1 01	0 00	0 00	0 00	0 00	1 13	1 76	2.26	0 84	17 09
1883..	0 67	0 27	3 61	1 65	5 01	0 00	0 00	0 00	0 65	3 78	0 86	0 50	17 00
1884..	2 48	2 16	5 57	2 93	0 40	2 11	0 00	0 00	0 86	1 40	0 00	5 28	23 19
1885..	2 26	1 01	0 30	0 75	0 53	0 58	0 00	0 00	0 30	0 27	8 99	5 42	20 41
1886..	4 44	0 75	2 29	4 17	0 00	0 96	0 00	0 00	0 00	0 97	0 15	2.78	15 91
1887..	0 68	6 53	1 33	2 31	0 00	0 96	0 00	0 00	0 00	0 00	1 05	2 53	15 44
1888..	4 95	1 15	1 94	0 15	0 00	1 20	0 00	0 01	0 68	0 00	4.49	5 35	19.92
1889..	0 34	0 50	5 68	0 97	1 78	0 42	0 00	0 00	0 00	7 80	2.59	9.74	29 82
1890..	5 26	2 51	5 65	1 97	1 87	0 00	0 00	0 00	1.28	0 00	0 00	3 24	21 78
1891..	1 36	8 76	1 23	1 78	0 20	0 96	0 15	0 00	0.16	0 34	0 46	4 39	19.79
1892..	5 02	3 28	4 58	3 31	3 24	0 00	0 00	0 00	0 00	0 92	6.31	9 08	36 24
1893..	5 54	4 14	5 46	1 63	1 34	0 00	0 00	0 00	0 07	0 00	3 53	3.18	25 49
1894..	7 19	2 52	1 68	0 00	1 80	0 97	0 00	0 00	2 00	2 64	0.73	11 08	30 01
1895..	11 77	2 58	2 67	3 25	0 51	0 00	0 47	0 00	3 15	0 00	1 17	1 78	27 35
1896..	10 08	0.21	2 99	5 88	1 60	0 00	0 00	0 41	0 76	0 52	5 52	5.81	33 78
1897..	3 89	5 94	1 44	1 36	0 18	0 61	0 00	0 00	0 10	3 26	1.58	2.38	20 74
1898..	0 85	5 30	0 19	0 47	1 63	0 00	0 00	0 00	0 40	0 40	1.26	1 31	12.81
1899..	7 17	0 00	4 21	0 52	0 81	2 27	0 00	0 12	0 00	2 95	5 05	4 20	27.30
1900..	3 79	0 95	2 60	2 47	1 64	0 55	0 00	0 00	T.	2.22	4 75	1 77	20 14
Average (30 years) ..	4 46	3 32	2 70	1 79	0 96	0 42	0 04	0 03	0 47	1.41	2.56	4 22	22.35

## CORONADO.

By Mr FORD A CARPENTER, Observer, Weather Bureau

Coronado is practically an island; only a long and a very narrow strip of land connects it with the mainland. San Diego Bay may be likened to an inverted J lying northwest and southeast. Coronado lies snugly within the curve of the J and has a southern exposure. It is therefore readily seen that the climate of Coronado is substantially that of San Diego. The differences are slight and have only been determined by comparison of the records of self-registering instruments

Regular meteorological observations have been made at Coronado since the erection of the Hotel del Coronado in February, 1888, but it has only been a little over a year since a set of recording instruments has been installed. The instruments now used comprise a Richards barograph located in the hotel lobby (elevation 30 feet above sea level), one Richards thermograph and other recording thermometers exposed in a standard instrument shelter on the northwest lawn, 75 feet away from any building, tree, etc., and 20 feet above sea level. The rain gage is located on the lawn near the instrument shelter. The photographic sunshine recorder is mounted on the east tower of the hotel. Such is the instrumental equipment of Coronado as installed by the San Diego office of the United States Weather Bureau.

The region in which Coronado is situated lies too far south to be affected very much by the areas of low pressure that enter the Pacific coast near Vancouver. Probably four-fifths of the northern storm areas of winter are too distant to cause any fluctuations of the barometer. This is also true of the summer storms of the southwest. Areas of high barometer are almost as persistent during the winter months as areas of low pressure during the summer. The highs are responsible for the relative warm, dry, and clear winter weather, and the lows for damp, cool, and cloudy summer months.



## AVERAGE AND EXTREME DATA FOR A PERIOD OF THIRTEEN YEARS.

[Record began February 1, 1888.]

	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	For the year.
<b>Temperature:</b>													
Average .....	55	57	58	60	63	64	66	69	68	65	60	56	61.7
Average daily range .....	17	16	14	14	12	10	11	12	12	14	17	16	13.8
Mean maximum .....	63	64	65	67	69	70	72	73	74	71	69	65	68.5
Mean minimum .....	46	48	49	54	57	59	61	65	62	56	50	48	54.6
Highest .....	80	85	86	93	98	93	84	90	93	93	91	88	93
Lowest .....	32	34	36	41	45	51	55	54	53	48	38	32	32
<b>Humidity:<sup>a</sup></b>													
Average relative (per cent.) ..	73	75	77	76	79	79	81	81	82	79	72	72	77.3
Average absolute (inches) ..	0.277	0.298	0.347	0.373	0.402	0.465	0.517	0.555	0.555	0.417	0.334	0.310	0.404
Precipitation, average in inches.	2.20	1.91	1.55	.73	.35	.06	0	.02	.04	.29	.76	1.90	9.61
<b>Wind:</b>													
Prevailing direction .....	NW.	NW.	W.	W.	W.	W.	W.	W.	NW.	NW.	NW.	NW.	NW.
Average hourly velocity (miles) <sup>a</sup> .....	4.9	5.4	5.5	5.6	6.0	5.8	5.5	5.7	4.9	4.7	4.8	4.9	5.4
<b>Weather:</b>													
<b>Average number of days—</b>													
Clear .....	20.	20	20	18	18	14	24	22	21	20	23	19	239
Partly cloudy .....	6	6	5	8	8	7	3	6	5	6	5	5	70
Cloudy .....	5	2	6	4	5	9	4	3	4	5	2	7	56
Rainy .....	6	7	7	5	3	1	0	0	1	2	3	7	42
With fog .....	2	1	1	2	0	1	1	1	1	5	2	1	18
<b>Largest number of days—</b>													
Clear .....	25	25	25	26	24	23	30	28	28	27	28	29	30
Partly cloudy .....	15	11	12	11	11	17	13	10	8	13	11	8	17
Cloudy .....	9	13	12	13	17	11	4	10	11	12	13	15	17
<b>Smallest number of days—</b>													
Clear .....	12	9	8	9	3	5	13	14	16	12	12	10	3
Partly cloudy .....	3	2	2	2	2	3	1	1	0	2	0	1	0
Cloudy .....	2	0	2	2	5	0	0	0	0	2	2	1	0

<sup>a</sup> Data from the San Diego Weather Bureau station, which is  $2\frac{1}{2}$  miles northeast of Coronado and 60 feet higher.

## GILROY.

[Data from records of Southern Pacific Railway Company.]

Gilroy is situated near the southern line of Santa Clara County, 30 miles southeast of San Jose, in latitude  $36^{\circ} 59'$  north, longitude  $121^{\circ} 33'$  west; elevation, 193 feet.

The mean annual temperature, based upon records covering twenty-seven years, is  $58.4^{\circ}$ . July and August are the warmest months, with mean temperatures of  $68.8^{\circ}$  and  $67.9^{\circ}$ , respectively, and the coldest month is January, with a mean of  $46.5^{\circ}$ . The highest monthly mean recorded is  $77.3^{\circ}$ , in July, 1875, and the lowest  $39.9^{\circ}$ , in December, 1874. Following are the maximum temperatures in the past five years:  $103^{\circ}$  in August, 1897;  $107^{\circ}$  in July, 1898;  $99^{\circ}$  in June, 1899;  $106^{\circ}$  in August, 1900, and  $104^{\circ}$  in August, 1901. The lowest temperatures recorded in recent years are  $23^{\circ}$  in December, 1897, and  $20^{\circ}$  in December, 1898.

The average annual precipitation, from 1874 to 1900, inclusive, is 19.55 inches. The rainy season extends from October to April, the greatest precipitation occurring in December and January, and frequent rains occur in May and September. The greatest monthly precipitation recorded is 12.33 inches, in December, 1880, and the greatest annual, 32.95 inches, in 1884.

## CLIMATOLOGY OF CALIFORNIA.

## MONTHLY AND ANNUAL MEAN TEMPERATURE (DEGREES FAHRENHEIT)

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual.
1874.....	46 5	46 5	49 0	57 8	66 8	72 4	71 6	68 5	66 4	57 7	57 2	39 9	58 3
1875.....	43 3	45 2	48 4	63 6	75 5	70 2	77 3	68 6	63 8	63 3	52 3	48 1	60 0
1876.....	43 2	46 0	52 9	60 8	63 7	68 9	68 4	67 1	65 8	61 9	54 7	48 8	58 5
1877.....	51 3	54 8	59 1	59 0	61 8	69 4	71 1	67 7	69 5	58 0	52 5	47 9	60 2
1878.....	49 3	49 8	54 4	57 4	63 0	64 1	66 3	66 4	65 6	61 9	53 9	45 3	58 1
1879.....	44 6	58 2	56 6	58 5	60 6	66 4	66 4	68 1	65 8	60 9	50 6	45 0	58 1
1880.....	43 7	44 1	46 8	53 7	60 2	63 5	64 3	64 8	63 6	59 4	47 0	50 7	55 2
1881.....	49 0	53 3	54 2	59 8	61 4	65 1	68 6	65 6	66 8	58 6	49 1	48 1	58 3
1882.....	43 7	43 8	55 3	55 1	61 7	63 9	66 5	66 8	64 5	58 4	52 1	48 0	56 6
1883.....	43 2	45 6	55 4	55 1	60 8	68 9	72 0	68 5	69 6	60 2	49 8	47 2	58 0
1884.....	46 5	48 4	54 1	56 8	63 0	65 2	71 1	69 9	65 6	60 0	53 8	49 6	58 7
1885.....	50 0	52 5	58 6	59 5	65 1	65 1	69 0	69 6	68 4	63 4	55 0	50 8	60 6
1886.....	48 7	55 5	55 9	58 6	62 7	69 3	72 5	71 5	65 3	57 9	51 5	53 2	60 2
1887.....	47 7	46 8	56 5	56 9	62 4	66 6	65 0	63 7	67 9	64 1	52 7	46 3	58 0
1888.....	44 8	51 1	52 3	62 0	61 8	71 9	71 4	74 1	70 8	61 7	55 4	51 4	60 7
1889.....	46 0	49 5	56 7	61 3	63 7	67 1	68 6	69 1	67 8	61 1	54 8	48 7	59 5
1890.....	43 8	47 7	54 1	58 3	63 7	65 2	68 7	66 2	65 8	61 2	54 1	48 2	58 1
1891.....	46 9	49 3	53 7	58 0	60 1	68 1	67 7	71 6	67 5	60 6	54 1	47 6	58 8
1892.....	49 1	51 4	54 9	53 1	61 3	66 4	68 4	69 1	66 6	61 1	54 7	48 9	58 8
1893.....	47 8	49 8	55 1	57 6	62 3	66 9	69 1	67 6	63 1	60 0	53 9	51 0	58 7
1894.....	45 7	48 2	51 3	61 0	60 1	63 2	68 0	67 6	66 9	61 2	56 5	49 4	58 2
1895.....	47 6	51 6	52 6	57 1	61 8	67 2	67 3	67 6	63 9	58 9	48 8	44 4	57 4
1896.....	46 0	49 1	52 9	51 1	59 2	66 8	67 6	67 9	61 4	62 6	48 4	48 2	56 8
1897.....	42 1	48 1	49 4	57 3	63 2	67 2	68 3	67 3	64 7	53 6	50 0	43 5	56 2
1898.....	43 1	48 9	49 5	59 0	60 7	67 4	68 3	70 6	63 4	60 8	51 7	47 0	57 5
1899.....	51 0	51 2	53 5	59 2	58 0	67 6	67 1	63 8	68 0	60 6	55 2	49 6	58 7
1900.....	50 0	50 3	55 6	53 8	62 0	65 4	66 7	65 6	64 0	58 8	55 8	48 0	58 0
Mean (27 years).....	46 5	49 3	53 7	57 8	62 5	67 0	68 8	67 9	66 0	60 3	52 8	48 0	58 4

## MONTHLY AND ANNUAL PRECIPITATION (INCHES AND HUNDREDTHS)

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual.
1874.....	5 22	2 04	3 15	0 95	0 16	0 00	0 00	0 00	0 00	3 55	2 09	0 01	17 20
1875.....	7 70	0 75	0 69	0 00	0 00	0 30	0 00	0 00	0 00	0 00	11 75	1 88	23 07
1876.....	6 75	3 97	5 93	0 76	0 00	0 00	0 00	0 00	0 00	1 25	0 00	0 00	18 66
1877.....	3 75	0 00	0 82	0 27	0 44	0 00	0 00	0 00	0 00	0 10	1 14	1 56	8 08
1878.....	8 98	11 48	3 24	1 62	0 00	0 00	0 00	0 00	0 00	0 88	0 70	0 42	27 32
1879.....	3 80	4 02	3 98	1 47	1 34	0 15	0 00	0 00	0 00	1 00	1 68	3 63	21 07
1880.....	2 36	1 74	1 84	9 48	0 65	0 00	0 00	0 00	0 00	0 00	0 46	12 33	28 86
1881.....	6 84	1 95	1 14	0 59	0 00	0 11	0 00	0 00	0 34	0 46	0 81	2 35	14 59
1882.....	1 28	2 17	5 61	0 72	0 25	0 10	0 00	0 00	1 46	2 22	1 64	0 38	15 83
1883.....	2 28	1 02	2 77	1 19	2 23	0 00	0 00	0 00	0 27	1 01	0 33	0 78	11 88
1884.....	2 94	6 65	7 24	3 80	0 34	1 24	0 00	0 00	0 12	1 73	0 06	8 83	32 95
1885.....	2 03	0 09	0 28	1 48	0 00	0 12	0 05	0 11	0 00	0 00	6 77	2 10	13 33
1886.....	6 09	0 82	1 17	4 32	0 22	0 00	0 00	0 00	0 00	0 78	0 33	1 09	11 32
1887.....	0 90	5 14	0 82	2 05	0 00	0 00	0 00	0 00	0 43	0 00	1 15	4 32	14 81
1888.....	5 35	0 77	3 92	0 40	0 44	0 00	0 00	0 00	0 32	0 00	3 71	2 10	17 01
1889.....	0 46	1 00	4 22	0 63	2 00	0 00	0 00	0 00	0 00	5 36	2 98	10 21	26 86
1890.....	10 50	5 62	1 89	0 64	0 55	0 00	0 00	0 00	0 20	0 00	0 10	3 84	23 34
1891.....	0 75	6 76	0 97	2 18	0 04	0 00	0 00	0 00	0 03	0 07	0 11	5 80	16 71
1892.....	4 71	1 90	4 18	0 90	1 21	0 00	0 00	0 00	0 00	1 19	5 40	3 99	23 48
1893.....	3 11	4 34	4 80	1 35	0 32	0 00	0 00	0 00	0 06	0 02	0 72	1 87	16 59
1894.....	4 71	3 04	0 66	0 55	1 28	0 00	0 00	0 00	1 04	1 26	0 24	8 41	21 22
1895.....	10 39	1 79	2 54	1 90	1 21	0 00	0 00	0 00	0 00	1 27	1 04	1 01	22 05
1896.....	10 06	0 00	2 06	4 02	4 34	0 00	0 00	1 00	0 09	1 88	3 75	1 99	29 19
1897.....	2 05	4 97	5 53	0 45	0 02	0 09	0 00	0 00	0 05	1 94	0 35	1 93	17 38
1898.....	0 98	2 27	1 24	0 32	1 28	0 08	0 00	0 00	0 16	0 40	0 33	0 93	7 98
1899.....	6 00	0 32	9 80	0 51	1 00	0 00	0 00	0 00	0 00	2 40	3 09	2 79	25 91
1900.....	2 22	0 34	1 65	1 60	0 45	0 00	0 00	0 00	0 01	1 59	9 29	0 99	18 14
Average (27 years).....	4 53	2 76	3 04	1 64	0 73	0 08	T	0 04	0 17	1 12	2 22	3 21	19 55

## HOLLISTER.

[Data from records of Mr. J. N. Thompson and Southern Pacific Railway Company.]

Hollister is the county seat of San Benito County, and is situated near the terminus of the Tres Pinos line of the Southern Pacific Railroad, 95 miles southeast of San Francisco, about 20 miles east of Monterey Bay, in latitude  $36^{\circ} 51'$  north, longitude  $121^{\circ} 25'$  west; elevation, 284 feet above sea level.

The mean annual temperature, based upon records covering twenty-seven years, is  $58.9^{\circ}$ . The warmest month is July, with a mean temperature of  $67.2^{\circ}$ , and the coldest is January,  $48.8^{\circ}$ . The highest monthly mean recorded in the last ten years is  $76.7^{\circ}$ , in July, 1891, and the lowest  $42.8^{\circ}$ , in January, 1898. The highest temperature recorded in recent years is  $105^{\circ}$ , in August, 1900, and the lowest is  $19^{\circ}$ , January 1, 1901.

The average annual precipitation during the past twenty-seven years is 12.31 inches, which is 7.24 inches less than the average for the same period at Gilroy, 15 miles to the northwest. The heaviest rains occur in January and December, and the greatest monthly precipitation in recent years was 7.35 inches, in December, 1889. Very little rain falls during the months of June, July, and August.

## MONTHLY AND ANNUAL MEAN TEMPERATURE (DEGREES FAHRENHEIT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1874.....	46.3	48.5	51.4	57.0	60.9	66.6	68.3	68.7	68.6	60.5	56.6	50.4	58.6
1875.....	46.9	53.4	52.3	65.1	77.0	76.4	72.7	74.9	75.0	68.6	57.0	51.0	64.2
1876.....	45.5	48.1	49.2	61.9	67.5	74.4	69.7	70.7	68.1	62.3	58.3	47.7	60.2
1877.....	54.0	55.4	59.9	61.5	65.2	73.0	69.0	66.9	69.4	64.9	56.9	50.7	62.2
1878.....	50.3	57.4	54.3	55.9	63.6	62.8	64.3	62.8	64.4	59.9	54.3	46.9	58.1
1879.....	46.3	54.2	57.2	57.4	58.6	63.4	65.3	68.9	65.5	61.3	53.3	48.4	58.3
1880.....	45.6	46.5	49.7	55.1	61.7	61.6	62.9	63.5	62.8	59.2	51.9	52.8	56.1
1881.....	51.2	55.3	57.5	60.4	61.3	64.2	65.4	64.9	64.3	57.0	50.4	49.3	58.4
1882.....	50.0	49.8	55.3	59.2	61.0	60.0	66.0	66.9	64.9	58.7	51.4	51.6	57.9
1883.....	47.4	49.8	54.9	55.5	61.4	67.1	66.0	67.3	66.3	57.6	51.6	50.8	58.0
1884.....	49.6	53.5	53.1	56.0	62.9	67.4	70.6	69.5	66.2	61.6	57.3	52.4	60.0
1885.....	52.4	55.9	59.3	60.7	66.2	66.0	68.8	67.4	68.2	64.8	58.0	55.7	62.0
1886.....	49.7	55.3	53.1	58.7	64.7	68.0	71.3	73.3	68.3	63.3	53.8	52.1	61.0
1887.....	51.9	49.0	59.8	59.4	65.5	68.0	64.9	62.4	65.0	62.1	56.1	52.2	59.7
1888.....	47.6	54.3	54.9	60.9	61.3	67.9	68.4	68.4	63.7	59.0	58.9	53.5	59.5
1889.....	47.6	48.1	58.7	64.0	65.1	61.7	68.8	68.5	69.0	61.4	57.0	56.1	60.6
1890.....	49.9	55.0	57.9	59.5	66.1	66.0	70.4	66.5	62.5	59.7	54.3	51.3	60.0
1891.....	50.6	52.3	56.5	60.7	62.2	70.9	76.7	69.9	71.2	61.9	59.8	47.6	61.7
1892.....	51.1	54.0	56.3	55.4	61.3	63.3	65.6	65.8	63.0	58.5	51.5	47.9	57.3
1893.....	47.4	48.1	51.6	51.7	58.7	64.3	64.5	61.7	58.5	56.9	54.2	47.7	55.4
1894.....	47.0	49.1	53.1	61.9	61.8	64.4	67.3	68.9	63.8	61.9	58.4	52.1	59.1
1895.....	48.7	52.0	53.2	55.8	59.3	63.5	64.7	64.1	63.5	61.3	51.5	46.0	57.0
1896.....	51.0	52.8	53.8	51.2	56.7	61.9	64.3	61.4	59.1	57.0	51.4	51.0	56.0
1897.....	46.4	48.2	48.3	57.4	60.2	64.2	65.3	65.5	64.4	57.2	50.6	46.0	56.4
1898.....	42.8	52.7	50.6	59.9	56.1	65.0	64.2	65.8	64.4	61.7	52.4	45.6	56.8
1899.....	50.5	50.0	51.8	55.8	54.5	64.2	64.2	62.6	66.6	59.2	54.6	47.2	56.8
1900.....	50.3	51.1	56.6	53.0	60.8	64.1	64.1	64.1	64.2	59.5	56.4	48.0	57.7
Mean (27 years) .....	48.8	51.9	54.5	58.2	62.3	65.9	67.2	66.7	65.6	60.6	54.5	50.1	58.9

## CLIMATOLOGY OF CALIFORNIA.

## MONTHLY AND ANNUAL PRECIPITATION (INCHES AND HUNDREDTHS)

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1874 .....	4 04	0 96	2 51	0 86	0 37	0 00	0 00	0 00	0 00	2 33	1 15	0 00	11 72
1875 .....	5 10	0 16	0 50	0 00	0 00	0 13	0 00	0 00	0 00	0 00	7 68	0 00	13 57
1876 .....	2 13	2 77	2 63	0 18	0 18	0 00	0 00	0 00	0 00	0 88	0 00	0 00	8 77
1877 .....	1 83	0 25	0 53	0 78	0 42	0 00	0 00	0 00	0 00	0 00	1 03	1 54	6 88
1878 .....	5 98	6 61	1 56	1 40	0 00	0 00	0 00	0 00	0 00	0 29	0 20	0 36	16.40
1879 .....	1 83	1 99	1 90	1 53	0 64	0 07	0 00	0 00	0 00	0 95	1 06	2 51	12 48
1880 .....	1 20	0 85	1 83	3 47	0 51	0 00	0 00	0 00	0 00	0 00	0 80	5 52	14 18
1881 .....	2 59	1 81	1 05	0 61	0 00	0 10	0 00	0 00	0 24	0 20	0 04	1 08	8 32
1882 .....	1 78	1 50	3 46	1 20	0 10	0 24	0 00	0 00	0 45	1 32	0 95	0 22	11.23
1883 .....	1 44	0 86	1 84	0 99	1 54	0 00	0 00	0 00	0 25	0 68	0 35	0 90	8 85
1884 .....	1 05	3 80	4 33	2 66	0 32	1 85	0 00	0 05	0 00	1 30	0 00	3 62	19 33
1885 .....	0 58	0 17	0 35	0 45	0 00	0 23	0 27	0 00	0 00	0 00	4 91	1 12	8 08
1886 .....	3 93	0 22	1 29	2 55	0 15	0 00	0 00	0 00	0 00	0 38	0 42	0 54	9 48
1887 .....	0 57	3 63	0 55	1 32	0 04	0 02	0 00	0 00	0 43	0 00	0 60	1 54	8 70
1888 .....	2 61	0 97	2 75	0 40	0 80	0 02	0 00	0 00	0 20	0 00	2 20	2 00	11 95
1889 .....	0 88	0 87	3 06	0 81	1 26	0 00	0 00	0 00	0 00	2 91	2 09	7 35	19 23
1890 .....	5 70	2 15	1 45	0 52	0 31	0 00	0 00	0 00	0 45	0 00	0 05	2 51	13 14
1891 .....	0 46	3 22	1 85	2 01	0 05	0 00	0 00	0 00	0 00	0 00	0 37	4 09	11 55
1892 .....	0 13	1 53	3 49	0 64	1 33	0 00	0 00	0 00	0 02	0 87	2 82	3.79	14.62
1893 .....	1 50	2 87	4 25	0 98	0 32	0 00	0 00	0 00	0 11	0.04	0 77	1 98	12 82
1894 .....	3 99	2 77	0 79	0 40	1 07	0 09	0 00	0 00	0 65	1 11	0 29	5 06	16.12
1895 .....	5 74	1 49	1 95	1 34	1 00	0 00	0 02	0 00	0 06	0 82	0 88	1.07	14 37
1896 .....	6 76	0 07	1 42	2 49	0 47	0 00	0 00	1 10	0 03	1 55	1 91	1.31	17.11
1897 .....	1 06	2 99	3 38	0 51	0 06	0 14	0 00	0 03	0 06	1 08	0.46	1 47	11.24
1898 .....	0 82	1 04	0 61	0 78	0 80	0 00	0 00	0 00	0 26	0 11	0 36	1 32	6 10
1899 .....	2 35	0 25	4 01	0 55	0.00	0 67	0 00	0 00	0 00	2 19	2 32	1.70	14 04
1900 .....	0 90	0 26	0 75	1 67	1 10	0 03	0 00	0 00	0 00	1 13	5 69	0 97	12.50
Average (27 years) .....	2 48	1 71	1 99	1 13	0 49	0 13	0 01	0 04	0 12	0 75	1 48	1 98	12.31

## INDEPENDENCE.

## MONTHLY MEAN TEMPERATURE (DEGREES FAHRENHEIT).

[Data by Mr J J McLean, Observer, U S Weather Bureau]

Years.	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept.	Oct	Nov	Dec.	Annual.
1894 <sup>a</sup> .....	..	..	..	..	..	..	..	..	..	..	..	38 4	..
1895 <sup>a</sup> .....	37 8	45 5	49 2	57 3	65 6	71 6	78 0	76 0	68 3	60 0	48 3	37 8	58.0
1896 <sup>a</sup> .....	43 2	47 2	44 0	..	..	..	..	..	..	..	..	..	..
1897 <sup>a</sup> .....	..	..	..	..	..	..	..	..	..	..	..	..	..
1898 <sup>a</sup> .....	..	..	..	62 0	62 1	74 2	80 4	80 1	72 0	60 0	48.2	39 7	..
1899 .....	40 2	46 5	50 5	59 4	60 0	74 2	80 4	72 6	74 6	55.4	49 4	43 1	58 8
1900 .....	46 6	48 1	54 9	52 0	65 8	75 4	79 4	72 4	63 5	58 8	50 4	43.4	59 2
Sum .....	167 8	187 3	198 6	230 7	253 5	295 4	318 2	301 1	278 4	234 2	196 3	202 4	176 0
Mean .....	42 0	46 8	49 6	57 7	63 4	73 8	79 6	75 3	69 6	58 6	49 1	40.5	58.7

<sup>a</sup> Station closed.

## SUMMARY OF MONTHLY MEANS AND EXTREMES OF TEMPERATURE (DEGREE FAHRENHEIT).

Month.	Highest monthly mean.		Lowest monthly mean.		Absolute maximum.		Absolute minimum.		Greatest daily range.	Mean daily range.	Mean variability.	Mean of 8 consecutive warmest days.	Mean of 8 consecutive coldest days.
	Date.	Temperature.	Date.	Temperature.	Date.	Temperature.	Date.	Temperature.					
January .....	1900	46.6	1895	37.8	13, 1895	69.0	4, 1898	12.0	37.0	21.4	3.4	49.8	34.1
February .....	1900	48.1	1895	45.5	19, 1899	75.0	6, 1899	11.0	37.0	25.0	3.2	55.4	34.7
March .....	1900	54.9	1896	44.0	11, 1900	78.0	14, 1898	19.0	35.0	24.3	4.5	58.7	38.3
April .....	1898	62.0	1900	52.0	26, 1898	87.0	5, 1895	28.0	36.0	25.3	3.9	67.2	47.3
May .....	1900	65.8	1899	60.0	7, 1895	89.0	2, 1899	34.0	37.0	25.5	3.6	72.4	51.8
June .....	1900	75.4	1895	71.6	22, 23, 29, 1898	99.0	3, 1898	38.0	35.0	27.0	2.8	82.8	61.5
July .....	1898-9	80.4	1895	78.0	29, 1898	105.0	1, 1898	49.0	34.0	26.8	2.2	86.3	72.8
August .....	1898	80.1	1900	72.4	1, 1898	104.0	30, 1895	46.0	37.0	27.8	2.2	82.1	66.8
September .....	1899	74.6	1900	63.5	17, 1898 2, 1899	94.0	22, 1895	34.0	42.0	28.6	2.7	75.7	59.2
October .....	1895, 1898	60.0	1899	55.4	12, 1895	88.0	12, 1899 20, 1900	29.0	39.0	26.3	2.8	67.6	47.4
November .....	1900	50.4	1898	48.2	4, 1898	81.0	24, 1898 23, 1895	24.0	37.0	24.6	3.4	59.2	39.4
December .....	1900	43.4	1895	37.8	28, 1898	68.0	21, 1895	16.0	39.0	21.9	3.4	48.5	31.7
Annual .....	1900	59.2	1895	59.0	1898	105.0	1899	11.0	42.0	25.4	3.2	67.1	48.8

## WEATHER.

Month.	Average number—				Month.	Average number—			
	Clear days.	Partly cloudy days.	Cloudy days.	Rainy days.		Clear days.	Partly cloudy days.	Cloudy days.	Rainy days.
January .....	15	8	8	6	August .....	25	4	1	1
February .....	23	4	1	2	September .....	24	4	2	2
March .....	18	10	2	3	October .....	24	6	1	2
April .....	19	8	2	2	November .....	18	8	3	4
May .....	20	8	3	3	December .....	17	10	4	4
June .....	24	5	1	1	Annual .....	251	80	30	31
July .....	24	5	2	1					

## MONTHLY AND ANNUAL PRECIPITATION (INCHES AND HUNDREDTHS).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.	Season of—	Seasonal.
1894 .....													1.89		
1895 .....	1.24	1.18	0.12	T.	0.01	T.	T.	0.04	T.	0.83	0.67	0.08	4.17		
1896 .....	1.67	0.00													
1897 .....															
1898 .....			0.00	0.16	0.23	T.	T.	0.11	0.20	0.00	0.10	0.20			
1899 .....	0.54	T.	0.01	0.02	0.03	0.37	0.01	0.06	T.	0.30	0.85	0.56	2.75	1898-9	1.58
1900 .....	0.11	0.05	0.67	0.62	0.22	0.04	0.08	T.	0.75	0.01	1.84	0.13	4.22	1899-1900	3.69
Sum .....	3.76	1.23	0.80	0.80	0.49	0.41	0.09	0.21	0.95	1.14	2.96	2.86	11.14		
Mean .....	0.94	0.31	0.20	0.20	0.12	0.10	0.02	0.05	0.24	0.28	0.74	0.57	2.78		

## CLIMATOLOGY OF CALIFORNIA.

## GREATEST MONTHLY PRECIPITATION (INCHES AND HUNDREDTHS) AND DATE

Month	Year	Amount	Month	Year	Amount	Month	Year	Amount
January . . . . .	1896	1 67	May . . . . .	1898	0 23	September . . . . .	1900	0 75
February . . . . .	1895	1 18	June . . . . .	1899	0 37	October . . . . .	1895	0 83
March . . . . .	1900	0 67	July . . . . .	1900	0 08	November . . . . .	1900	1 31
April . . . . .	1900	0 62	August . . . . .	1898	0 11	December . . . . .	1894	1 89

## LEAST MONTHLY PRECIPITATION (INCHES AND HUNDREDTHS) AND DATE

Month	Year	Amount	Month	Year	Amount	Month	Year	Amount
January . . . . .	1900	0 31	May . . . . .	1900	0 01	September . . . . .	1895	T
February . . . . .	1900	0 05	June . . . . .	1895 1898	T	October . . . . .	1899 1898	0 00
March . . . . .	1898	0 00	July . . . . .	1895 1898	T	November . . . . .	1898	0 10
April . . . . .	1895	T	August . . . . .	1900	T	December . . . . .	1895	0 08

## NUMBER OF TIMES MONTHLY PRECIPITATION HAS EXCEEDED THE NORMAL FOR FOUR YEARS

Month	Total	First two years	Second two years	Month	Total	First two years	Second two years	Month	Total	First two years	Second two years
January . . . . .	2	2	0	May . . . . .	0	0	0	September . . . . .	2	1	1
February . . . . .	1	1	0	June . . . . .	1	0	1	October . . . . .	1	1	0
March . . . . .	1	0	1	July . . . . .	0	0	0	November . . . . .	3	1	2
April . . . . .	1	0	1	August . . . . .	0	0	0	December . . . . .	0	0	0

## TOTAL NUMBER OF DAYS WITH PRECIPITATION SINCE DECEMBER 1, 1894

Month	Less than 0 01	0 01 to 0 10	0 11 to 0 25	0 26 to 0 50	0 51 to 1 00	Month	Less than 0 01	0 01 to 0 10	0 11 to 0 25	0 26 to 0 50	0 51 to 1 00	Month	Less than 0 01	0 01 to 0 10	0 11 to 0 25	0 26 to 0 50	0 51 to 1 00
January . . . . .	3	14	5	0	3	May . . . . .	5	10	1	0	0	September . . . . .	5	3	2	0	1
February . . . . .	5	3	1	0	1	June . . . . .	4	4	1	0	0	October . . . . .	1	7	1	0	1
March . . . . .	1	6	1	1	0	July . . . . .	5	3	0	0	0	November . . . . .	2	9	1	2	2
April . . . . .	9	4	2	1	0	August . . . . .	2	5	0	0	0	December . . . . .	9	12	3	3	1

Station closed January 1 to November 30, 1894, March 1, 1896, to February 28, 1898

## FOGGY DAYS AND THUNDERSTORMS

Month.	Total number of foggy days	Number of thunderstorms	Month	Total number of foggy days	Number of thunderstorms	Month	Total number of foggy days	Number of thunderstorms.
January . . . . .	0	0	May . . . . .	0	0	September . . . . .	0	3
February . . . . .	0	0	June . . . . .	0	3	October . . . . .	0	0
March . . . . .	0	0	July . . . . .	0	7	November . . . . .	0	0
April . . . . .	0	0	August . . . . .	0	7	December . . . . .	0	0

Record began December 1, 1894—closed January 1 to November 30, 1894—March 1, 1896, to February 28, 1898.

## NUMBER OF HIGH WINDS

Month	Velocity (miles)			Month	Velocity (miles)			Month	Velocity (miles)		
	30-35	36-40	Over 40		30-35	36-40	Over 40		30-35	36-40	Over 40
January . . . . .	12	5	9	May . . . . .	20	10	6	September . . . . .	4	4	2
February . . . . .	18	5	7	June . . . . .	14	0	0	October . . . . .	10	3	3
March . . . . .	18	8	14	July . . . . .	4	0	1	November . . . . .	13	7	1
April . . . . .	18	7	8	August . . . . .	6	0	0	December . . . . .	8	2	5

Record began December 1, 1894—closed January 1 to November 30, 1894—March 1, 1896, to February 8, 1898.

## HIGHEST WIND VELOCITY, DIRECTION, AND DATE FOR EACH MONTH.

Month.	Velocity (miles).	Direction.	Date.	Month.	Velocity (miles).	Direction.	Date.	Month.	Velocity (miles).	Direction.	Date.
January.....	48	SE.	17, 1895	May.....	48	NW.	27, 1895	September .....	52	NW.	30, 1898
	48	SE.	2, 1899		48	SE.	10, 1900		48	NW.	1, 1898
February .....	66	S.	26, 1900	June .....	50	W.	1, 1898	October .....	48	W.	28, 1900
March .....	54	NW.	9, 1899	July .....	44	SW.	19, 1899	November .....	50	N.	21, 1895
April .....	52	SE.	28, 1899	August .....	39	W.	2, 1900	December .....	66	NW.	29, 1898
	52	W.	2, 1900								

Record began December 1, 1894—closed January 1 to November 30, 1894—March 1, 1896, to February 8, 1898.

## AVERAGE VELOCITY (MILES PER HOUR) OF AFTERNOON WINDS.

Month.	2 to 3.	3 to 4.	4 to 5.	Month.	2 to 3.	3 to 4.	4 to 5.	Month.	2 to 3.	3 to 4.	4 to 5.
January.....	9.1	8.9	8.4	May.....	10.4	12.2	13.4	September .....	7.6	8.7	10.2
February.....	11.0	11.3	11.4	June .....	9.4	10.8	11.4	October .....	7.8	8.4	8.6
March.....	11.4	12.2	12.4	July .....	8.8	10.5	11.7	November .....	8.2	8.0	8.6
April.....	12.0	12.5	13.2	August.....	8.1	10.2	11.5	December.....	8.4	8.3	8.7

## AVERAGE HOURLY VELOCITY (MILES PER HOUR).

	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1 a. m. ....	6.9	8.8	9.3	9.8	10.4	8.7	8.0	7.9	7.1	7.1	7.0	7.1
2 a. m. ....	7.1	9.2	8.7	9.8	10.0	8.4	7.4	7.2	7.0	6.8	7.2	7.3
3 a. m. ....	7.2	9.0	9.2	9.8	9.2	7.7	6.6	6.3	7.1	7.1	7.5	7.1
4 a. m. ....	7.1	9.2	9.3	9.2	10.0	7.2	6.4	5.6	7.6	7.0	7.6	7.4
5 a. m. ....	7.1	9.0	9.2	9.0	9.2	7.4	6.2	5.4	7.2	7.2	7.6	7.3
6 a. m. ....	7.2	9.4	9.0	8.6	8.9	7.6	5.8	5.3	6.6	7.1	7.2	7.5
7 a. m. ....	6.8	9.1	8.9	8.3	8.8	7.3	5.8	5.3	6.3	7.1	6.8	7.6
8 a. m. ....	6.8	8.8	8.7	8.3	8.4	7.1	5.8	5.2	6.5	6.7	6.9	7.8
9 a. m. ....	7.3	8.8	8.4	8.4	7.8	7.3	5.9	5.0	6.7	6.9	7.0	7.8
10 a. m. ....	7.3	8.4	8.2	8.9	8.3	7.4	5.9	4.9	6.6	6.7	7.0	7.8
11 a. m. ....	7.5	8.0	8.8	10.3	9.5	8.3	6.5	5.8	7.1	6.8	6.8	7.5
12 noon .....	7.2	8.7	10.2	11.8	9.7	8.4	6.8	6.6	7.6	7.5	7.1	7.2
1 p. m. ....	7.8	10.1	11.3	11.8	9.6	8.3	6.8	6.2	8.1	8.6	8.1	7.7
2 p. m. ....	8.8	10.7	11.2	11.3	9.6	8.1	7.1	6.5	7.7	8.6	8.5	8.1
3 p. m. ....	9.1	11.0	11.4	12.0	10.4	9.2	8.8	8.1	7.6	7.8	8.2	8.4
4 p. m. ....	8.9	11.3	12.2	12.5	12.2	11.2	10.5	10.2	8.7	8.4	8.0	8.3
5 p. m. ....	8.4	11.4	12.2	13.2	13.4	11.6	11.7	11.5	10.2	8.6	8.7	8.3
6 p. m. ....	8.1	11.5	13.1	13.7	14.0	11.9	12.2	12.3	10.8	8.9	8.7	8.1
7 p. m. ....	8.0	11.4	13.8	14.0	14.3	12.2	12.0	12.4	10.6	9.3	8.0	7.4
8 p. m. ....	7.7	11.0	14.0	14.0	14.0	12.7	12.0	11.5	10.7	8.3	7.6	7.5
9 p. m. ....	8.1	9.7	12.6	13.3	13.6	12.1	12.4	11.0	9.6	7.8	7.3	7.4
10 p. m. ....	7.6	9.1	10.9	11.8	12.0	10.8	10.8	9.6	9.3	7.7	6.8	6.3
11 p. m. ....	7.1	8.4	10.6	11.2	10.7	9.2	9.4	9.3	8.7	7.4	6.6	6.5
12 midnight .....	6.9	8.9	9.6	10.2	10.6	9.1	8.7	8.5	8.1	7.1	6.6	6.8
Average .....	7.6	9.6	10.4	10.9	10.6	9.1	8.3	7.8	8.1	7.6	7.4	7.5

## MEAN MONTHLY RELATIVE HUMIDITY (PER CENT).

Month.	A. M.	P. M.	Average.	Month.	A. M.	P. M.	Average.	Month.	A. M.	P. M.	Average.
January.....	58	41	49	May.....	34	14	24	September .....	27	12	20
February .....	44	26	35	June .....	27	12	20	October .....	38	20	29
March .....	41	17	29	July .....	23	10	14	November .....	45	28	36
April.....	35	13	25	August.....	30	12	21	December.....	54	37	45

## ANNUAL METEOROLOGICAL SUMMARY FOR THE YEARS 1899 AND 1900.

[ $\lambda=36^{\circ} 48' N$ ,  $\phi=118^{\circ} 12' W$ , gravity corr., -0.02 H=3,910 ft,  $h_1=51$  ft,  $h_r=43$  ft,  $h_s=58$  ft]

Month	Pressure			Temperature								Moisture									
	Monthly mean	Extremes		Mean					Extremes		Dew-point		Relative humidity		Vapor pressure		Precipitation		Cloudiness 0-10		
		Maximum	Minimum	8 a. m.	8 p. m.	Maximum	Minimum	Monthly	Maximum	Minimum	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	Total	Maximum in 24 hours.	8 a. m.	8 p. m.	Daylight
		In	In	°	°	°	°	°	°	°	°	°	%	%	In	In	In	In	°	°	°
1899	In	In	In	°	°	°	°	°	°	°	°	°	%	%	In	In	In	In	°	°	°
January.....	26 06	26 38	25 54	34.4	46.6	51.2	29.2	40.2	68	12	21	18	60	38	0.118	0.107	0.54	0.44	2.6	3.3	2.3
February.....	25 98	26 27	25 45	40.0	56.0	58.8	34.2	46.5	75	11	14	8	33	15	0.082	0.063	T	T	0.9	1.8	1.2
March.....	25 88	26 32	25 56	43.2	58.5	62.4	38.6	50.5	75	26	17	3	34	11	0.095	0.053	0.01	0.01	2.2	4.2	2.6
April.....	25 90	26 14	25 54	50.1	69.2	71.5	47.2	59.4	83	33	19	9	30	12	0.105	0.070	0.02	0.02	1.8	3.1	2.3
May.....	25 86	26.08	25 66	50.4	69.0	72.0	48.1	60.0	88	34	19	11	30	12	0.107	0.082	0.03	0.02	3.0	2.5	2.1
June.....	25 90	26.15	25 62	68.3	85.6	87.8	60.7	74.2	96	46	33	32	34	19	0.192	0.194	0.37	0.26	1.3	1.7	1.1
July.....	25 92	26 08	25 79	69.7	92.6	94.0	66.8	80.4	100	62	25	18	18	7	0.135	0.106	0.01	0.01	0.2	1.2	0.7
August.....	25 88	26 07	25 66	62.6	84.6	85.9	59.4	72.6	91	52	28	22	28	11	0.157	0.123	0.06	0.06	0.8	1.9	1.3
September.....	26 01	26 24	25 74	64.4	87.0	88.8	60.3	74.6	94	51	21	17	19	7	0.114	0.095	T	T	1.0	0.7	0.7
October.....	25 95	26 26	25 43	47.8	62.6	67.5	43.3	55.4	84	29	21	19	37	21	0.119	0.111	0.30	0.18	1.5	2.8	2.0
November.....	26 00	26 20	25 62	43.0	55.2	61.0	37.8	49.4	70	30	26	26	50	35	0.140	0.144	0.85	0.77	2.8	4.1	3.3
December.....	26 07	26 39	25 68	37.2	48.1	54.1	32.1	43.1	67	21	19	17	48	30	0.108	0.098	0.56	0.45	1.6	3.2	2.5
Year.....	25 95	26 39	25 43	50.5	67.9	71.2	46.5	58.9	100	11	22	17	35	18	0.122	0.104	2.75	0.77	1.6	2.5	1.8
1900	In	In	In	°	°	°	°	°	°	°	°	°	%	%	In	In	In	In	°	°	°
January.....	26 07	26 26	25 82	40.4	53.2	58.2	35.1	46.6	67	29	25	24	56	34	0.141	0.133	0.31	0.22	3.0	3.3	3.0
February.....	25 99	26 28	25 60	40.9	57.4	60.8	35.4	48.1	69	25	17	8	36	14	0.091	0.066	0.05	0.05	1.5	3.1	2.2
March.....	25 93	26 22	25 58	46.7	65.0	67.6	42.2	54.9	78	28	19	12	35	15	0.110	0.081	0.67	0.38	2.3	3.9	3.2
April.....	25 84	26 12	25 46	44.1	59.6	63.7	40.3	52.0	81	33	20	14	41	22	0.114	0.091	0.62	0.54	2.7	4.7	3.9
May.....	25 89	26 08	25 59	56.9	76.6	78.5	53.1	65.8	88	40	26	18	35	14	0.149	0.107	0.22	0.11	2.6	1.9	2.4
June.....	25 89	26 05	25 64	65.0	86.2	88.8	61.9	75.4	98	53	28	19	26	10	0.154	0.110	0.04	0.04	1.4	3.3	2.2
July.....	25 88	26 11	25 58	70.1	91.0	92.7	66.0	79.4	100	55	29	24	24	10	0.166	0.132	0.08	0.07	1.0	1.2	1.2
August.....	25 89	26 14	25.73	63.3	84.3	85.9	58.8	72.4	96	52	28	19	27	9	0.155	0.106	T	T	0.6	1.5	1.0
September.....	26 02	26 25	25 43	54.6	73.4	76.4	50.6	63.5	83	38	27	20	36	16	0.151	0.117	0.75	0.68	1.1	1.7	1.6
October.....	25 95	26 21	25 66	50.7	67.7	71.5	46.2	58.8	80	29	24	20	36	18	0.137	0.084	0.01	0.01	2.0	2.4	2.4
November.....	26 04	26 30	25 52	43.8	57.2	62.9	38.0	50.4	74	30	23	21	46	30	0.126	0.123	1.34	0.95	2.6	3.2	2.3
December.....	26 12	26 30	25 70	37.2	49.1	55.3	31.5	43.4	66	15	20	19	49	30	0.110	0.106	0.13	0.08	1.0	3.2	2.5
Year.....	25 95	26 30	25 46	51.1	68.4	71.9	46.6	59.2	100	15	24	18	37	18	0.134	0.105	4.22	0.95	1.8	2.8	2.4



## ANNUAL METEOROLOGICAL SUMMARY FOR THE YEARS 1899 AND 1900.

[H=3,910 ft.; h<sub>1</sub>=51 ft.; h<sub>2</sub>=43 ft.; h<sub>3</sub>=58 ft.]

Month.	Wind.										Number of days.																
	By self-registers.				Number of winds, 8 a. m. and 8 p. m.						Precipitation.		Maximum temp.		Minimum temperature below 32°.		Thunderstorms.		Electricity.								
	Average hourly velocity.	Prevailing direction.	Maximum velocity.	Direction at time of maximum velocity.	Number of days with gales.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calm.	Clear.	Partly cloudy.	Cloudy.	0.01 inch and over.	0.04 inch and over.	Snow.	Hail.	Fog.	Below 32°.	Above 90°.	Minimum temperature below 32°.	Thunderstorms.	Auroras.
1899.	Miles.		M.																								
January .....	8.8	NW.	48	SE.	2	6	0	2	4	3	0	10	36	1	24	4	3	5	3	5	0	0	0	0	18	0	0
February .....	10.8	NW.	54	NW.	2	16	2	0	8	4	0	5	20	1	25	2	1	0	0	0	0	0	1	0	7	0	0
March .....	11.8	NW.	54	NW.	6	4	0	0	8	9	3	9	28	1	18	13	0	1	0	1	0	0	0	0	4	0	0
April .....	10.9	NW.	52	SE.	3	3	1	1	14	2	4	12	23	0	24	6	0	1	0	1	0	0	0	0	0	0	0
May .....	11.4	NW.	42	W.	3	2	0	1	10	3	4	11	31	0	26	5	0	2	0	0	0	0	0	15	0	0	0
June .....	9.3	NW.	39	SE.	0	3	0	0	15	4	2	11	24	1	26	3	1	3	3	0	0	0	0	28	0	1	0
July .....	7.9	NW.	44	SW.	1	1	2	2	18	8	0	9	21	1	28	3	0	1	0	0	0	0	0	3	0	2	0
August .....	7.8	NW.	32	W.	0	1	0	0	18	11	2	12	18	0	27	4	0	1	1	0	0	0	0	14	0	2	0
September .....	7.5	NW.	36	W.	0	4	1	0	14	6	0	9	26	0	27	3	0	0	0	0	0	0	0	0	0	0	0
October .....	8.8	NW.	36	NW.	0	7	0	1	8	9	4	9	23	1	22	8	1	4	2	0	0	0	0	0	3	0	0
November .....	5.8	NW.	34	S.	0	2	0	2	16	10	5	2	23	0	16	12	2	4	3	0	0	0	0	0	4	0	0
December .....	8.3	NW.	33	N.	0	3	1	1	6	7	3	9	32	0	21	9	1	4	3	1	0	0	0	0	14	0	0
Year .....	9.1	NW.	54	NW.	17	52	7	10	139	76	27	108	305	6	284	72	9	26	15	8	0	0	1	60	50	5	0
1900.																											
January .....	5.9	NW.	40	N.	1	6	1	1	10	14	2	5	23	0	16	13	2	4	3	0	0	0	0	0	5	0	0
February .....	9.5	NW.	66	S.	3	9	0	0	11	3	2	4	27	0	23	5	0	1	1	0	0	0	0	0	6	0	0
March .....	8.3	NW.	44	W.	1	6	2	0	12	3	4	10	25	0	17	10	4	5	2	0	0	0	0	0	3	0	0
April .....	12.1	NW.	52	W.	3	4	3	0	12	5	2	4	30	0	15	12	3	4	3	0	0	0	0	0	0	0	0
May .....	10.1	NW.	48	SE.	2	5	1	0	17	7	0	8	22	2	22	7	2	4	2	0	0	0	0	0	0	0	0
June .....	8.7	NW.	41	W.	1	3	0	2	17	8	1	12	17	0	22	7	1	2	0	0	0	0	0	15	0	2	0
July .....	8.4	NW.	28	W.	0	0	1	1	15	7	0	13	25	0	26	4	1	2	1	0	0	0	0	23	0	1	0
August .....	7.9	SE.	39	W.	0	0	1	0	26	5	5	11	14	0	26	5	0	0	0	0	0	0	0	8	0	2	0
September .....	8.6	NW.	48	W.	1	5	0	1	16	7	6	9	16	0	22	7	1	4	3	0	1	0	0	0	0	2	0
October .....	8.0	NW.	48	W.	2	3	0	3	18	7	3	10	18	0	22	9	0	1	0	0	0	0	0	0	1	0	0
November .....	6.5	NW.	36	SW.	0	3	1	0	10	6	10	8	21	1	19	8	3	6	5	0	0	0	0	0	5	0	0
December .....	7.3	NW.	48	SW.	1	9	0	1	4	2	6	6	32	2	18	13	0	3	2	0	0	0	0	0	16	0	0
Year .....	8.4	NW.	66	S.	15	53	10	9	168	74	41	100	270	5	248	100	17	36	22	0	1	0	0	46	36	7	0

## AVERAGE SNOWFALL SINCE DECEMBER 1, 1894.

Month.	Amount.	Month.	Amount.	Month.	Amount.	Month.	Amount.
January .....	1.82	April .....	T.	July .....	0.00	October .....	0.00
February .....	T.	May .....	T.	August .....	0.00	November .....	0.00
March .....	0.02	June .....	0.00	September .....	0.00	December .....	0.68

## LIVERMORE

[Data from records of Southern Pacific Railway Company ]

Livermore is located in the foothills of Alameda County, about 40 miles southeast of Oakland, in latitude  $37^{\circ} 40'$  north, longitude  $121^{\circ} 45'$  west; elevation, 485 feet

The mean annual temperature, based upon records covering thirty years, is  $59.7^{\circ}$ . July and August are the warmest months, with mean temperatures of  $70.1^{\circ}$  and  $69.6^{\circ}$ , respectively, and January is the coolest, with a mean of  $49.3^{\circ}$ . Maximum temperatures of  $103^{\circ}$  have been recorded in August, 1898, July, 1899, and June, 1901. The lowest temperature recorded in recent years is  $23^{\circ}$ , December 31, 1900. Minimum temperatures below  $32^{\circ}$  occur frequently in the months of January, February, and December, and occasionally in March.

The average annual precipitation from 1871 to 1900, inclusive, is 15.30 inches—about the same as that of Stockton. The greatest annual rainfall, 27.65 inches, occurred in 1884, and the least, 7.94 inches, in 1877. Rain seldom falls in July and August.

MONTHLY AND ANNUAL MEAN TEMPERATURE (DEGREES FAHRENHEIT)

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1871	50.0	52.9	52.5	59.8	63.2	75.9	79.0	77.9	80.2	68.4	52.7	49.6	63.5
1872	48.7	54.5	52.3	54.7	61.9	65.2	68.2	70.0	71.4	66.2	58.2	49.6	60.1
1873	49.4	48.2	49.8	52.7	62.2	68.0	72.2	70.4	69.8	67.7	54.9	44.3	59.1
1874	49.5	47.7	51.2	56.4	64.1	71.8	75.5	73.8	76.6	60.5	58.9	51.6	61.5
1875	52.1	56.8	53.8	64.2	71.6	70.8	72.9	73.9	72.4	70.3	57.8	52.8	64.1
1876	48.3	47.7	50.6	55.6	64.2	75.4	70.3	67.0	72.1	67.0	58.1	49.8	60.5
1877	52.5	53.3	58.4	57.3	60.7	73.3	77.4	69.5	71.7	64.8	59.0	53.6	62.6
1878	54.5	54.7	59.1	63.0	65.3	70.2	73.4	76.3	67.2	63.9	58.0	49.7	62.7
1879	52.1	59.9	60.2	62.0	61.7	72.2	72.6	77.6	73.7	65.6	57.7	49.8	63.8
1880	51.8	47.7	54.8	57.2	63.5	64.9	72.2	70.5	71.7	64.6	54.0	53.8	60.6
1881	54.2	56.0	55.7	63.3	65.4	67.0	72.8	68.1	68.5	61.6	55.4	51.1	61.6
1882	48.1	48.1	54.5	56.7	62.3	62.1	70.1	70.2	66.8	65.4	55.8	56.3	59.7
1883	47.9	45.2	56.3	55.6	61.9	71.0	69.7	68.4	69.5	59.7	44.6	51.2	58.4
1884	49.7	49.2	54.1	54.4	59.8	62.2	67.6	67.5	63.3	60.2	55.5	50.0	57.8
1885	54.4	55.5	55.9	56.4	59.2	57.1	63.3	65.7	64.4	60.6	54.4	51.2	57.4
1886	45.7	54.4	51.0	54.8	60.8	68.1	70.1	72.4	68.5	61.6	53.3	57.4	59.8
1887	52.1	45.7	57.3	56.1	60.5	65.9	66.3	66.4	67.1	66.4	57.3	52.5	59.5
1888	46.9	53.7	53.7	59.9	58.8	64.0	63.6	66.0	64.6	59.5	51.9	47.6	57.5
1889	45.6	52.8	57.2	59.0	62.3	64.9	66.8	67.8	68.0	62.4	53.8	46.9	59.0
1890	42.8	49.0	52.9	55.4	57.5	61.0	69.9	71.9	70.2	65.5	56.8	52.9	58.8
1891	50.5	49.1	57.2	55.5	58.8	68.2	74.3	72.3	66.6	61.6	54.6	47.5	59.6
1892	49.2	52.8	54.8	55.0	62.8	64.0	67.0	69.9	65.6	59.5	55.2	48.9	58.7
1893	44.3	49.1	50.2	54.8	60.8	64.3	70.2	68.9	61.6	59.2	54.3	51.8	57.5
1894	46.3	49.0	49.9	55.5	59.7	62.0	69.5	71.1	69.8	60.7	56.7	49.4	58.3
1895	47.2	51.3	52.7	55.7	60.8	69.7	68.5	69.3	64.3	63.8	53.8	47.3	58.7
1896	51.9	53.3	54.3	52.3	58.7	69.8	74.4	68.4	64.4	60.2	51.2	52.6	59.3
1897	45.5	49.7	48.1	59.6	64.3	81.8	72.3	68.6	63.7	57.7	52.5	51.2	59.6
1898	49.1	53.1	51.0	57.8	54.6	62.9	65.0	61.9	59.4	59.2	51.5	48.4	56.2
1899	51.4	50.6	51.0	54.8	55.1	68.1	61.7	64.8	67.3	59.4	55.5	46.5	57.2
1900	48.6	56.2	53.8	55.4	58.1	65.1	66.2	62.5	64.7	60.3	53.6	50.5	57.9
Mean (30 years)	49.3	51.6	53.8	56.9	61.4	67.6	70.1	69.6	68.2	62.8	54.9	50.5	59.7

## MONTHLY AND ANNUAL PRECIPITATION (INCHES AND HUNDREDTHS).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1871.....	1.42	1.93	0.36	1.25	0.02	0.00	0.00	0.00	0.00	T.	1.13	11.69	17.80
1872.....	2.15	2.69	0.65	0.43	0.00	0.32	0.00	T.	0.00	0.00	1.22	3.87	11.33
1873.....	1.04	3.73	0.68	0.15	0.00	0.00	0.00	0.00	0.00	0.42	0.70	4.48	11.20
1874.....	2.96	1.03	1.34	0.95	0.32	0.06	0.00	0.00	0.30	1.67	2.03	0.20	10.86
1875.....	5.40	1.20	0.35	0.00	0.00	0.52	0.00	0.00	0.00	0.00	7.23	1.62	16.32
1876.....	2.68	3.01	4.39	0.73	0.33	0.00	0.00	0.00	0.00	1.26	0.10	0.00	12.50
1877.....	2.47	0.56	1.10	0.13	0.39	0.00	0.00	0.00	0.00	1.27	1.29	0.73	7.94
1878.....	4.61	6.73	2.01	0.96	0.06	0.00	0.00	0.00	0.00	0.24	0.81	0.17	15.09
1879.....	2.83	1.73	2.49	0.75	1.34	0.20	0.00	0.00	0.00	0.83	1.06	1.94	13.22
1880.....	1.48	1.80	1.45	6.51	0.91	0.00	0.00	0.00	0.00	0.00	0.65	7.75	20.55
1881.....	2.40	2.62	1.06	1.93	0.00	0.04	0.00	0.00	T.	0.08	0.73	1.97	10.88
1882.....	1.07	1.72	4.85	1.03	0.20	0.00	0.00	0.00	0.34	1.52	1.48	0.88	12.59
1883.....	2.38	0.63	3.45	1.50	2.18	0.00	0.00	0.00	0.35	1.52	0.57	0.44	13.02
1884.....	4.03	5.29	5.92	2.70	0.20	1.73	0.00	0.10	0.30	1.14	0.02	6.22	27.65
1885.....	1.72	0.36	0.78	1.29	0.08	0.00	0.00	0.00	0.05	0.00	6.20	1.94	12.42
1886.....	4.20	0.24	1.18	2.36	0.00	0.00	0.40	0.00	0.00	0.30	0.70	0.81	10.19
1887.....	0.90	6.23	0.23	1.60	0.00	0.00	0.00	0.00	0.80	0.00	0.61	3.51	13.88
1888.....	3.20	0.94	2.51	0.60	0.06	0.30	0.00	0.00	0.76	0.00	3.80	2.21	14.98
1889.....	0.46	0.67	5.15	0.51	2.25	T.	0.00	0.00	0.00	3.94	2.95	8.63	24.56
1890.....	5.24	3.71	2.85	0.86	0.48	0.00	0.00	0.00	1.20	0.00	0.00	3.31	17.65
1891.....	0.54	4.18	2.50	1.88	0.40	0.15	0.00	0.00	1.32	0.05	0.38	4.42	15.82
1892.....	0.84	1.08	3.96	0.90	1.30	T.	0.00	0.00	0.45	1.65	4.97	7.27	22.42
1893.....	3.02	3.12	3.68	1.40	0.73	0.00	0.00	0.00	0.00	0.00	1.59	2.14	15.68
1894.....	4.97	5.36	0.81	0.58	1.19	0.52	0.00	0.00	1.45	1.15	0.50	8.56	25.09
1895.....	6.83	1.56	1.81	1.26	1.25	0.00	0.00	0.00	0.22	0.83	1.69	1.28	16.73
1896.....	7.16	0.17	1.50	3.11	0.39	0.00	0.00	0.73	0.55	1.48	3.02	1.71	19.82
1897.....	1.89	3.54	4.04	0.24	0.00	0.08	0.00	0.00	0.06	1.43	0.52	1.31	13.11
1898.....	1.47	1.78	0.78	0.45	0.96	0.35	0.00	0.00	0.95	0.35	0.25	1.61	8.95
1899.....	2.60	0.08	2.70	0.33	0.18	0.22	0.00	0.00	0.00	2.52	2.49	1.86	12.98
1900.....	2.44	0.34	1.11	0.86	1.10	0.00	0.00	0.00	0.18	1.93	4.48	1.26	13.70
Average (30 years) .....	2.81	2.27	2.19	1.24	0.56	0.15	0.01	0.03	0.31	0.85	1.76	3.11	15.30

## MAMMOTH TANK.

[Data from records of Southern Pacific Railway Company.]

Mammoth Tank is situated in the eastern portion of San Diego County, on the line of the Southern Pacific Railroad, and in the southern portion of the Colorado desert, in latitude  $33^{\circ}07'$ , longitude  $115^{\circ}17'$ ; elevation above sea level, 257 feet.

The mean annual temperature, based upon records extending over a period of twenty-three years, is  $76^{\circ}$ . The warmest month is July, with a mean temperature of  $98.5^{\circ}$ , and the coldest January,  $53.9^{\circ}$ . The highest temperature recorded was  $130^{\circ}$ , on August 17, 1885, and the lowest  $22^{\circ}$ , in December, 1895, making an absolute range of  $108^{\circ}$ . Temperatures of  $100^{\circ}$  and over have been recorded in every month except January, February, November, and December, and temperatures of  $90^{\circ}$  and above in every month of the year. Temperatures of  $120^{\circ}$  and over have occurred in five months—May, June, July, August, and September. Temperatures of  $32^{\circ}$  and below have occurred in January, February, and December.

The mean annual rainfall for twenty-three years is 1.81 inches; the greatest annual, 5.48 inches, fell in 1889, and the least, a trace, in 1897 and 1898. The greatest monthly rainfall was 3.18 inches, in December, 1889. June has been practically a rainless month, no appreciable amount having been recorded during that month and only a trace once in twenty-three years.

CLIMATOLOGY OF CALIFORNIA.

MAXIMUM TEMPERATURE (DEGREES FAHRENHEIT)

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1878.	76	80	96	102	106	112	116	118	114	108	94	91
1879	92	104	108	108	117	119	119	115	104	90	78	78
1880	78	78	84	102	104	115	114	114	114	100	88	80
1881.	75	96	101	104	104	111	116	112	110	99	78	79
1882	73	78	93	104	105	112	119	118	118	112	90	84
1883	84	84	92	100	118	129	121	118	122	97	96	86
1884	74	85	86	101	113	128	126	128	115	105	96	84
1885	83	91	95	105	124	118	127	130	124	113	94	84
1886	90	89	99	101	120	124	128	126	120	99	88	82
1887	80	86	101	107	112	128	128	115	110	100	92	75
1888.	85	85	100	105	105	111	117	114	113	103	83	75
1889	75	80	91	106	110	110	120	119	108	108	81	72
1890	80	84	92	100	111	112	118	116	115	96	94	78
1891	84	72	90	104	105	120	121	116	113	106	88	79
1892	80	82	89	98	110	116	120	115	110	99	86	84
1893	80	82	93	100	106	112	115	113	106	96	85	81
1894	75	82	96	100	102	105	115	110	108	100	92	68
1895	72	85	96	98	109	113	114	117	106	98	83	81
1896	80	88	100	90	114	122	117	116	110	104	85	76
1897	74	83	87	107	110	110	115	118	108	90	87	75
1898	78	87	88	109	108	116	120	118	111	101	92	76
1899	80	85	90	100	105	118	118	111	112	100	86	78
1900	79	85	95	96	106	110	115	111	101	95	88	80
Absolute maximum and year .....	{ 90 1886	96 1881	104 1879	109 1898	124 1885	129 1883	128 1886	130 1885	124 1885	113 1885	96 1883	91 1878

MINIMUM TEMPERATURE (DEGREES FAHRENHEIT)

1878	30	42	44	46	60	58	82	87	70	57	40	32
1879	42	51	52	64	69	80	88	72	60	42	30	30
1880	32	34	40	48	62	80	74	76	68	58	38	34
1881	38	40	40	60	66	70	88	72	70	58	44	42
1882	28	32	36	50	63	58	80	86	67	63	44	32
1883	25	38	61	55	59	77	75	80	72	50	42	40
1884	33	30	48	52	62	73	78	85	70	53	54	40
1885	39	49	50	58	65	74	77	78	70	62	50	44
1886	37	50	48	50	64	72	84	80	80	59	42	40
1887	30	38	54	57	68	84	78	70	70	64	34	32
1888	27	40	45	55	55	70	80	83	80	62	45	40
1889	30	30	50	54	56	67	80	81	73	55	38	38
1890	29	41	50	60	65	72	78	75	75	52	52	40
1891	28	31	48	56	60	60	75	85	70	62	37	25
1892	29	33	46	51	58	50	76	71	70	54	40	26
1893	32	32	40	50	58	75	81	81	60	58	39	37
1894	27	33	40	58	62	68	85	80	65	50	40	37
1895	35	42	50	54	60	60	80	70	70	60	36	22
1896	31	32	40	50	61	75	85	73	63	52	40	35
1897	38	40	47	52	65	70	81	82	75	57	42	32
1898	30	47	50	55	60	80	90	90	75	61	44	33
1899	35	29	50	53	50	60	70	75	80	50	50	36
1900	41	35	57	50	59	62	80	82	62	58	49	32
Absolute minimum and year...	{ 25 1883	29 1899	40 (a)	46 1878	50 1899	50 1892	74 1880	70 b 1887	60 1898	50 (a)	34 1887	22 1895

a Several years

b Also in 1895

## MONTHLY AND ANNUAL MEAN TEMPERATURE (DEGREES FAHRENHEIT).

[Elevation, 257 feet.]

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1878.....	56.0	61.7	67.8	72.3	82.3	90.7	98.2	105.0	90.9	78.5	65.4	55.3	77.0
1879.....	56.2	67.8	75.0	77.7	77.9	93.8	99.2	103.0	95.3	78.6	64.6	53.3	78.5
1880.....	55.9	54.4	61.0	73.0	83.0	95.5	95.9	96.5	90.8	76.9	60.1	56.9	75.0
1881.....	54.4	63.2	63.8	76.9	84.0	92.1	98.1	94.3	87.3	74.3	59.9	56.6	75.4
1882.....	48.3	53.7	62.4	74.0	83.5	90.3	100.9	100.0	92.4	77.0	64.2	62.2	75.7
1883.....	54.3	58.4	74.4	73.4	82.5	99.4	97.6	99.1	94.2	74.1	64.9	60.0	77.7
1884.....	54.7	59.0	58.9	68.8	85.0	92.9	99.8	100.1	89.9	80.3	66.9	54.5	75.9
1885.....	54.5	64.4	67.0	76.8	85.0	90.2	98.6	98.2	90.5	82.1	68.6	61.3	78.1
1886.....	56.7	66.7	66.3	75.9	90.8	95.7	102.9	102.3	96.7	77.2	62.3	60.8	79.5
1887.....	57.7	58.0	78.4	80.4	91.2	100.2	100.5	90.4	88.4	80.4	65.8	51.0	78.5
1888.....	49.6	59.4	63.0	82.0	82.6	93.4	97.2	96.0	93.9	78.6	61.3	52.0	75.3
1889.....	51.2	56.5	67.1	79.3	84.2	90.3	100.2	98.8	88.6	77.4	63.0	57.0	76.1
1890.....	50.4	59.0	69.1	77.8	83.6	88.7	95.2	93.1	90.9	74.9	63.3	59.0	75.3
1891.....	54.9	53.2	65.3	77.1	81.2	92.3	101.7	99.1	92.6	81.7	64.0	48.0	75.9
1892.....	52.1	57.3	64.3	74.8	84.6	85.8	93.0	90.2	86.4	70.8	64.4	52.5	73.0
1893.....	57.1	56.7	61.5	75.6	84.3	97.1	99.0	96.0	83.8	74.7	60.1	56.6	75.2
1894.....	50.8	52.6	63.6	75.4	83.3	86.1	96.5	94.6	88.2	76.9	65.5	51.1	73.7
1895.....	50.9	58.6	64.4	76.3	81.6	83.2	98.7	92.3	86.5	77.6	58.4	51.2	73.3
1896.....	56.4	61.6	67.1	68.2	82.9	93.8	102.8	97.4	87.4	78.6	63.7	57.3	76.4
1897.....	55.2	57.9	61.0	79.1	88.7	92.6	99.4	103.3	90.6	74.1	63.7	53.6	76.6
1898.....	50.4	56.1	63.8	78.5	80.6	97.5	101.8	101.6	92.9	75.5	60.0	51.4	75.8
1899.....	54.6	60.0	65.2	74.3	77.7	90.1	97.8	91.0	91.0	73.0	65.4	55.6	74.6
1900.....	58.2	59.6	69.6	67.6	82.0	89.7	95.3	93.0	80.0	73.8	67.4	57.3	74.5
Mean (23 years) .....	53.9	58.9	66.1	75.4	83.6	92.5	98.5	96.8	90.0	76.8	63.8	55.4	76.0

## MONTHLY AND ANNUAL PRECIPITATION (INCHES AND HUNDREDTHS).

	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1878.....	0.00	0.08	0.03	0.02	0.00	0.00	0.51	0.65	0.00	0.00	0.09	0.09	1.42
1879.....	0.00	0.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.68	0.28	0.13	1.64
1880.....	0.08	0.00	0.15	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.72	0.97
1881.....	0.00	0.00	0.22	0.80	0.00	0.00	0.28	0.88	0.00	0.26	0.00	0.00	2.44
1882.....	1.29	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.50	0.20	0.00	2.19
1883.....	0.00	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	1.22	2.02
1884.....	T.	1.36	0.22	0.07	0.19	0.00	0.00	T.	0.00	0.00	0.00	0.87	2.71
1885.....	0.00	0.02	0.00	0.00	0.00	0.00	T.	0.62	0.00	0.00	1.01	0.00	1.65
1886.....	0.57	0.20	0.25	0.05	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.24	1.33
1887.....	0.00	1.38	0.00	0.18	0.00	0.00	0.00	0.00	0.33	0.03	0.20	0.05	2.12
1888.....	0.05	0.07	0.05	0.03	0.01	0.00	0.40	0.10	0.00	0.43	0.73	0.87	2.74
1889.....	0.62	0.03	1.37	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.11	3.18	5.48
1890.....	0.00	0.54	0.00	0.00	0.00	0.00	0.10	0.00	0.12	0.30	0.00	0.54	1.60
1891.....	0.00	2.73	0.00	0.02	0.00	0.00	0.00	1.65	0.00	0.00	0.00	T.	4.40
1892.....	0.23	0.42	0.50	0.00	0.00	0.00	0.00	0.10	0.10	0.10	0.00	0.00	1.60
1893.....	0.05	0.00	1.17	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.35	0.02	1.89
1894.....	0.00	0.00	0.00	0.00	0.00	0.00	T.	0.06	0.36	T.	0.00	1.22	1.64
1895.....	0.80	T.	T.	0.00	0.00	T.	0.00	0.00	0.00	0.00	0.12	0.00	0.92
1896.....	T.	0.00	0.25	0.00	0.00	0.00	0.00	0.01	T.	T.	T.	0.00	0.26
1897.....	T.	T.	T.	0.00	0.00	0.00	0.00	0.00	T.	T.	0.00	T.	T.
1898.....	T.	0.00	T.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	T.	T.	T.
1899.....	0.06	0.00	0.00	0.00	0.00	0.00	0.15	1.10	0.00	0.00	0.23	T.	1.54
1900.....	0.15	0.00	0.25	0.30	0.00	0.00	0.00	0.00	0.20	0.26	0.00	0.00	1.16
Average (23 years) .....	0.17	0.35	0.19	0.06	0.02	T.	0.06	0.23	0.05	0.12	0.14	0.40	1.81

## OAKLAND.

The thriving city of Oakland is located on the eastern shore of San Francisco Bay, in latitude  $37^{\circ} 48'$  north, longitude  $122^{\circ} 17'$  west, with elevations varying from 9 to 50 feet above sea level. It is the chief suburb of San Francisco, and has a population of about 75,000. The temperature and precipitation data following are from records kept by Messrs. J. B. McChesney, J. Hutchinson, J. B. Trembly, and Prof. Charles Burkhalter, of Chabot Observatory.

The mean annual temperature, based upon records covering twenty-five years, is  $56^{\circ}$ , practically the same as that of San Francisco. A comparison of the maximum and minimum temperatures of the two cities, however, shows that as a rule the days are warmer and the nights cooler

in Oakland than in San Francisco. July is the warmest month, with a mean of 61.8°, and January the coolest, 47.6°. The temperature seldom exceeds 90° and rarely falls below 32°.

The average annual precipitation is 24.96 inches, or nearly 2 inches more than that of San Francisco. January and December are the months of heaviest rainfall. Rain seldom falls during the summer months.

MONTHLY AND ANNUAL MEAN TEMPERATURE (DEGREES FAHRENHEIT)

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov.	Dec	Annual
1876.	45 4	50 5	52 1	54 8	56 5	61 6	60 0	59 6	60 4	58 7	54 3	47 3	55 1
1877.	50 0	53 3	55 8	53 9	55 8	61 6	61 4	60 5	61 8	57 2	54 0	49 5	56 3
1878.	50 0	50 8	54 0	55 3	57 9	59 3	59 2	59 6	58 2	58 5	53 4	46 5	55 2
1879.	45 1	52 2	55 9	56 0	56 6	70 5	59 5	59 6	60 6	58 2	51 4	46 2	56 0
1880.	43 9	46 1	47 6	52 6	57 5	57 8	59 5	65 6	59 3	58 1	50 8	51 6	54 2
1881.	51 6	53 5	53 2	57 5	58 3	59 4	69 3	60 4	59 2	54 6	50 5	48 2	56 3
1882.	46 4	45 8	52 0	52 6	57 8	59 2	60 6	60 4	60 7	57 6	51 0	49 7	54 5
1883.	43 7	45 2	52 5	52 5	57 1	63 0	60 3	60 2	63 3	56 8	52 6	46 8	54 5
1884.	47 0	48 3	53 2	54 3	59 3	60 8	63 4	61 5	59 4	56 4	55 4	51 2	55 8
1885.	49 1	54 1	56 9	58 1	59 0	59 7	63 0	61 0	61 9	59 9	56 8	52 4	57 7
1886.	49 4	54 6	51 3	54 4	59 4	60 8	62 8	61 2	61 1	57 0	52 2	52 0	56 4
1887.	494	46 1	53 9	54 8	57 3	59 6	57 5	58 5	60 7	61 0	53 4	49 5	55 1
1888.	46 4	52 3	52 2	57 3	57 0	63 1	62 2	61 6	62 0	60 2	55 7	52 3	56 8
1889.	47 7	51 4	56 9	59 0	59 0	61 3	59 8	61 0	63 2	61 1	57 0	49 9	57 3
1890.	45 2	47 7	54 3	54 9	59 7	59 5	61 6	62 2	61 2	61 8	57 2	49 5	56 2
1891.	51 2	49 4	53 5	53 4	55 3	60 4	61 2	63 0	62 2	58 7	56 9	48 7	56 2
1892.	52 2	50 0	53 3	53 6	58 4	62 2	63 8	64 1	63 0	58 2	53 5	49 4	56 8
1893.	42 3	48 7	50 9	54 4	57 7	62 3	62 0	61 3	61 8	58 0	54 0	51 0	55 4
1894.	44 7	47 8	51 6	57 0	58 6	60 6	59 0	59 4	60 6	59 0	55 9	48 8	55 2
1895.	47 2	52 1	50 6	56 4	59 0	60 0	63 1	58 7	61 6	56 0	53 9	46 9	55 5
1896.	51 0	53 4	54 7	58 6	58 3	61 5	64 0	63 2	58 0	58 2	51 0	49 3	56 4
1897.	46 1	49 1	49 0	59 8	61 0	64 0	63 0	61 5	63 0	58 2	50 7	47 5	56 0
1898.	44 2	51 4	51 3	56 9	56 6	63 7	62 0	61 6	60 7	60 0	53 2	46 9	55 7
1899.	51 0	50 7	52 6	56 3	57 0	61 8	60 8	62 0	60 6	57 3	55 2	47 8	56 1
1900.	49 8	52 0	56 8	55 7	61 8	63 8	64 9	64 8	64 7	59 2	56 2	50 0	58 3
Mean (25 years)	47 6	50 3	53 0	55 4	58 1	61 5	61 8	61 3	61 2	58 4	53 8	49 2	56 0

MONTHLY AND ANNUAL PRECIPITATION (INCHES AND HUNDREDTHS)

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov.	Dec	Annual
1874.	5.60	1.80	5.25	1.25	0.75	0.00	0.00	0.00	0.00	2.24	9.18	0.31	26.38
1875.	6.15	0.30	1.65	0.00	0.10	1.64	0.00	0.00	0.00	0.30	7.84	4.10	22.08
1876.	5.28	4.87	4.55	0.93	0.45	0.24	0.10	0.00	0.15	4.74	0.25	0.00	21.56
1877.	4.19	1.42	0.96	0.22	0.30	0.00	0.18	0.00	0.00	0.45	1.62	1.75	11.09
1878.	10.82	11.63	4.30	1.18	0.40	T	0.00	0.00	0.00	1.85	0.65	0.31	31.14
1879.	4.34	5.65	7.96	1.17	1.39	0.15	0.00	0.00	0.00	0.70	2.98	5.06	29.40
1880.	1.71	2.19	1.70	8.46	1.04	0.00	0.00	0.00	0.57	0.00	0.35	12.57	28.59
1881.	10.48	3.95	0.88	1.40	0.40	1.16	0.00	0.00	0.40	0.82	1.49	5.09	26.07
1882.	2.42	2.05	4.20	1.51	0.15	T	0.00	0.00	0.42	2.65	4.33	1.14	18.87
1883.	1.95	0.70	3.33	2.20	0.50	0.00	0.00	0.00	1.00	1.03	0.90	1.15	15.76
1884.	3.81	5.25	8.59	5.79	0.55	3.03	T	0.25	0.35	2.80	0.05	7.73	38.20
1885.	1.92	0.48	1.07	3.12	0.10	0.08	0.02	0.00	0.05	0.30	11.11	4.33	22.58
1886.	8.12	0.30	2.57	5.11	0.30	0.00	0.15	0.00	0.05	1.69	0.45	3.60	22.24
1887.	1.57	7.83	0.71	2.35	0.10	0.05	0.01	0.00	0.27	0.00	0.78	3.22	16.89
1888.	6.42	1.02	4.44	0.10	0.38	0.46	0.00	0.00	0.92	0.06	3.52	4.82	22.14
1889.	0.90	0.63	7.60	0.93	1.92	0.07	0.00	0.00	0.00	7.30	2.89	13.38	35.62
1890.	10.22	5.72	3.52	1.18	1.17	T	T	T	0.10	0.00	0.00	3.91	25.82
1891.	0.95	11.37	3.10	2.77	1.60	0.11	0.15	0.00	0.87	0.20	0.55	6.64	28.31
1892.	2.81	3.68	2.89	1.09	2.49	0.00	T	T	0.04	2.51	5.04	6.47	26.72
1893.	3.68	3.25	5.76	0.98	0.34	0.00	0.00	0.00	0.03	0.29	5.76	2.57	22.66
1894.	9.02	3.70	0.79	0.41	1.89	0.95	0.01	0.00	1.66	2.64	1.34	11.78	34.19
1895.	11.82	3.09	2.00	1.93	1.12	0.00	0.03	0.00	1.07	0.13	2.09	1.74	24.52
1896.	11.03	0.24	2.64	6.88	0.80	0.00	0.00	0.68	0.82	1.72	6.11	4.29	35.21
1897.	3.32	5.99	6.00	0.52	0.29	0.42	T	T	0.16	3.27	1.18	2.49	23.64
1898.	1.30	2.85	0.26	0.19	1.50	0.39	0.00	T	1.16	1.48	0.60	1.48	11.21
1899.	5.59	0.07	12.16	0.78	1.64	0.06	0.00	0.00	0.00	4.89	5.05	3.20	34.04
1900.	4.81	0.87	2.67	1.48	1.07	0.08	0.00	T	0.06	1.60	5.00	1.58	19.22
Average (27 years)	5.16	3.37	3.76	2.00	0.95	0.33	0.02	0.03	0.33	1.69	3.03	4.25	24.96

## REDLANDS.

Redlands is situated in latitude  $34^{\circ} 31'$  north, longitude  $117^{\circ} 11'$  west. The elevation above sea level, 1,352 feet. The city is surrounded by mountains and nestles on the southern slope of the San Bernardino Valley. Within a distance of 15 miles are a number of towns and small cities of which may be mentioned San Bernardino, Colton, Riverside, Loma Linda, Highland, and Craftonville. Mount San Bernardino and Mount San Gorgonio, two of the highest peaks in southern California, wall in the valley to the north. The distance from Los Angeles by rail is 66 miles. The city is generally conceded to be one of the most beautiful in southern California. The mean annual temperature is  $64^{\circ}$ , which is about  $2^{\circ}$  warmer than Los Angeles. The prevailing wind direction is west. Owing to proximity of the mountains and the desert, the range of temperature is large. Maximum temperatures exceeding  $105^{\circ}$  are not infrequent during summer afternoons, but it must be remembered that the relative humidity is very low. The highest temperature recorded since 1897 is  $113^{\circ}$  on July 11, 1897. The lowest temperature for the same period,  $26^{\circ}$  on January 1, 1901. Owing to the topography, however, lower temperatures may have been experienced within short distances from the point of observation. The annual rainfall, as determined from twelve years' record, is 14.70 inches.

MONTHLY AND ANNUAL MEAN TEMPERATURE (DEGREES FAHRENHEIT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1898.....	54.2	50.7	51.9	58.7	66.0	73.1	77.0	77.5	88.4	62.2	54.0	58.6	61.4
1894.....	46.8	46.7	52.1	61.9	63.2	68.4	80.1	77.9	71.4	67.1	62.1	52.6	62.5
1895.....	47.7	52.3	55.7	62.0	68.2	73.7	72.8	76.7	68.9	65.0	60.4	52.9	63.0
1896.....	53.5	52.9	57.8	57.8	60.2	80.2	82.3	78.9	78.0	68.8	56.5	53.0	65.1
1897.....	48.7	48.2	49.9	63.0	69.3	74.7	82.2	83.0	71.7	60.4	57.1	49.7	63.2
1898.....	45.0	54.4	54.8	67.2	66.0	77.1	77.6	81.1	76.8	69.0	58.2	52.4	65.0
1899.....	53.4	54.6	54.8	62.2	60.8	70.6	77.6	73.4	79.0	63.6	60.4	55.9	63.9
1900.....	56.8	57.6	60.8	55.9	66.6	72.2	77.0	71.6	67.6	63.9	62.4	55.9	64.0
Mean (8 years).....	50.8	52.2	54.7	61.1	65.8	73.8	78.3	77.5	72.1	65.0	58.9	53.2	63.5

MONTHLY AND ANNUAL PRECIPITATION (INCHES AND HUNDRETHS).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1899.....	0.68	1.47	5.70	0.99	0.58	0.00	0.00	0.28	0.31	1.50	0.52	13.72	25.75
1890.....	4.69	3.03	0.89	0.16	0.68	0.00	0.00	2.16	0.88	0.29	0.00	3.02	15.80
1891.....	0.00	9.28	1.19	0.91	1.10	0.23	0.00	1.63	0.97	0.00	0.00	1.51	16.82
1892.....	0.87	4.37	2.06	0.13	0.00	0.00	0.00	0.00	0.03	0.00	0.63	1.58	9.67
1893.....	3.02	3.93	7.22	0.26	0.00	0.00	0.21	0.00	0.69	0.95	0.50	3.46	20.24
1894.....	1.43	1.04	1.01	0.25	0.64	0.00	0.00	0.09	0.17	0.07	0.00	7.38	12.08
1895.....	8.66	1.30	3.29	1.37	0.57	0.00	0.00	0.00	0.00	0.03	2.03	0.52	17.77
1896.....	1.52	0.24	3.96	0.01	1.14	0.06	0.01	2.00	0.00	1.72	2.07	1.37	14.10
1897.....	5.11	5.83	3.00	0.14	0.63	0.00	0.06	0.00	0.83	2.38	0.16	0.70	18.84
1898.....	1.96	0.79	0.99	0.31	2.15	0.00	0.10	0.00	0.00	0.04	0.22	0.62	7.18
1899.....	1.92	0.71	1.50	0.08	0.24	0.87	0.00	0.04	0.05	0.65	1.28	0.46	7.80
1900.....	1.20	T.	0.78	2.03	1.41	0.00	0.04	0.00	0.50	0.53	3.88	0.00	10.37
Mean (12 years).....	2.59	2.67	2.68	0.55	0.76	0.10	0.04	0.52	0.37	0.68	0.94	2.86	14.70

## RIVERSIDE.

Riverside is situated in latitude  $33^{\circ} 58' 30''$  north, longitude  $117^{\circ} 22' 30''$  west. The elevation above sea level, 851 feet. The city lies in the valley of the Santa Ana River and is surrounded by hills and mountains. Riverside is said to be the largest orange-growing community in the United States. The city is a large one in area, approximating 56 square miles. About 35 square miles are under irrigation. The mean annual temperature is  $63^{\circ}$ , and the mean annual rainfall 10 inches. Afternoon temperatures in summer are high, often exceeding  $105^{\circ}$ . The highest recorded temperature since 1897 was  $112^{\circ}$  on September 11, 1898. The lowest temperature,  $26^{\circ}$ , has occurred on several dates.

## CLIMATOLOGY OF CALIFORNIA.

## MONTHLY AND ANNUAL MEAN TEMPERATURE (DEGREES FAHRENHEIT)

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1882 .....	48 0	51 0	57 0	60 2	67 8	72 4	78 6	79 8	75 1	64 9	57 0	56 5	62 4
1883.....	52 3	51 5	60 9	60 2	66 7	78 1	79 4	79 6	76 8	62 0	58 6	54 6	65 1
1884 .....	52 5	54 6	55 0	60 3	67 2	71 5	77 7	78 2	69 2	68 6	59 7	51 3	63 4
1885.....	51 9	56 2	61 6	63 8	69 0	71 3	77 3	81 5	74 6	67 2	58 8	55 5	65 7
1886.....	53 7	58 0	55 2	59 6	68 7	74 1	77 0	79 2	72 8	60 7	55 1	55 4	64 1
1887.....	53 6	48 6	60 0	60 5	66 2	71 4	76 2	73 6	73 3	66 5	57 9	50 1	63 2
1888.....	48 4	51 2	53 1	62 4	62 5	70 2	76 3	75 3	74 4	64 1	56 0	51 8	62 1
1889.....	48 2	51 9	56 5	62 2	64 0	69 5	75 9	76 1	71 3	61 7	55 5	51 6	62 0
1890.....	43 0	50 2	52 5	58 0	62 5	67 1	76 1	75 8	69 6	63 0	57 7	54 0	60 8
1891.....	49 3	48 0	53 8	57 8	60 3	67 6	78 2	77 8	70 0	66 6	58 4	48 3	61 3
1892.....	53 4	53 8	56 6	59 8	64 9	68 2	73 1	74 3	70 4	62 0	59 5	51 0	62 2
1893.....	52 5	50 4	51 5	60 7	64 9	70 8	74 8	75 7	65 5	62 0	54 0	54 0	61 4
1894 .....	47 3	48 4	54 2	60 3	62 4	63 8	75 2	74 4	71 6	64 8	61 5	58 2	61 4
1895.....	49 8	50 8	56 7	60 6	67 7	71 4	74 8	75 2	71 6	66 0	56 6	51 4	62 7
1896.....	55 6	57 5	58 1	55 4	65 1	73 4	76 0	73 8	71 1	67 6	57 6	56 0	63 9
1897.....	52 6	50 1	51 1	63 3	66 0	69 0	75 3	77 7	71 9	61 5	59 2	51 7	62 5
1898.....	48 2	57 3	53 5	64 1	[65 2]	70 7	75 5	79 6	75 4	68 1	59 0	52 4	64 1
1899.....	52 8	53 4	54 5	61 0	60 6	69 2	76 8	72 4	77 5	63 0	60 2	55 8	63 1
1900.....	56 9	57 6	61 0	56 5	67 0	71 4	75 8	71 4	68 2	64 4	64 3	59 4	64 5
Mean (19 years) ..	51 1	52 7	55 9	60 4	65 2	70 6	76 3	76 4	72 1	64 2	58 2	53 4	62 9

## MONTHLY AND ANNUAL PRECIPITATION (INCHES AND HUNDREDTHS)

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1881 .....	0 48	0 25	1 30	0 74	0 03	0 00	0 00	0 00	0 10	0 40	0 25	0 40	3 95
1882.....	1 70	1 40	1 08	0 72	0 08	0 18	0 00	0 00	0 00	0 13	0 29	0 20	5 78
1883.....	0 09	0 83	0 89	0 26	0 25	0 00	0 00	0 00	0 00	0 97	0 00	2 25	5 54
1884.....	0 84	7 94	6 56	1 67	1 99	0 52	0 00	3 00	0 00	0 12	0 12	2 56	25 32
1885.....	0 77	0 00	0 01	2 15	0 24	0 00	0 00	0 00	0 00	0 02	1 34	0 62	5 15
1886.....	2 68	1 38	1 95	1 43	0 00	0 00	0 00	0 00	0 00	0 00	0 54	0 04	8 02
1887.....	0 13	3 30	0 02	1 70	0 17	0 02	0 00	0 00	0 00	0 75	0 87	0 85	7 81
1888.....	4 17	1 05	3 84	0 18	0 05	0 00	0 00	0 00	0 00	0 00	2 83	3 37	15 49
1889.....	0 87	1 30	5 10	1 33	0 25	0 00	0 00	0 00	0 09	1 35	1 82	7 80	20 41
1890.....	4 44	1 96	0 60	0 06	0 09	0 00	0 00	0 05	0 79	0 13	0 32	3 21	11 05
1891.....	0 13	6 36	0 40	1 04	0 46	0 00	0 00	0 00	0 13	0 03	0 00	1 29	9 84
1892 .....	0 00	2 60	1 07	0 00	1 32	0 00	0 00	0 00	0 00	0 29	0 28	0 94	6 50
1893.....	3 01	1 95	5 71	0 24	0 04	0 00	0 33	0 00	1 27	1 08	0 67	2 05	16 35
1894.....	0 69	0 33	0 70	0 00	0 00	0 00	0 00	0 26	0 20	0 05	0 00	5 22	7 45
1895.....	6 48	1 09	2 54	0 29	0 26	0 00	0 00	0 00	0 00	0 00	1 25	0 24	12 15
1896.....	1 72	0 00	3 16	0 56	0 58	0 00	0 02	0 23	0 00	2 07	1 48	0 92	10 74
1897.....	3 38	3 07	1 62	0 03	0 03	0 00	0 00	0 04	0 09	1 67	0 02	0 95	10 90
1898.....	1 74	0 12	0 80	0 18	0 27	0 00	0 00	0 00	0 00	0 00	0 01	1 38	4 50
1899.....	2 09	0 89	0 90	0 00	0 13	0 30	0 00	0 00	0 00	1 03	0 57	0 41	6 32
1900.....	1 01	0 01	0 95	0 74	1 29	0 00	0 00	0 00	0 00	0 28	2 51	0 00	6 79
Mean (20 years) ..	1 82	1 79	1 96	0 69	0 38	0 05	0 02	0 18	0 13	0 52	0 76	1 74	10 01

## SALINAS

The Salinas Valley stretches in a southeasterly direction from Monterey Bay for a distance of 75 miles or more, having an average width of 10 miles. On the west side of the valley rises the Santa Lucia Range, with an altitude of about 5,000 feet, while on the east rises the Gabilan Range, of somewhat less elevation.

The city of Salinas has a mean annual temperature of 56°, based upon records extending over a period of twenty-six years. The coldest month is January, with a mean temperature of 48°, and the warmest July, 63°. The highest temperature recorded is 96°, and the lowest 20°, giving an absolute range of 76°. The date of the first killing frost reported during the past winter was December 6. Killing frosts in the spring may occur as late as the beginning of April.



The mean annual rainfall is 14.12 inches. This amount has been exceeded 13 times in the past twenty-six years. The rainfall is fairly well distributed for agricultural purposes. July and August are practically rainless. Twice in the past quarter of a century the annual rainfall has not amounted to 7 inches, viz, in 1898, when but 6.94 inches fell, and 1877, when but 6.81 inches fell. Both of these were unusually dry years in California. In June, 1884, 2.66 inches of rain fell. The two months of greatest rainfall were February, 1878, when 8.77 inches fell, and December, 1889, when 8.72 inches fell. No rain fell during the months of December, 1874, and February, 1896. During December, 1876, only a trace of rain fell.

The prevailing wind direction is from the south. In the summer months west and north-west winds are most prevalent, but from November to March south winds prevail. The largest number of rainy days occurs with south winds. During the past three years the average number of rainy days, i. e., days on which 0.01 inch or more of rain fell, were January, 7; February, 4; March, 5; April, 2; May, 1; June, 1; July, none; August, none; September, 1; October, 6; November, 4; December, 4. The number of clear days in January averages 16; in May, 11; in June, 20; in October, 16.

## MEAN MONTHLY AND ANNUAL TEMPERATURE (DEGREES FAHRENHEIT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1874.....	51.0	49.7	51.5	57.2	62.3	64.2	63.7	64.7	65.0	61.0	54.2	46.1	57.6
1875.....	47.8	56.5	50.6	54.9	55.2	59.5	58.6	56.1	56.0	55.3	56.0	53.0	55.0
1876.....	48.4	53.0	53.0	57.0	58.8	63.6	63.9	61.8	62.4	59.8	52.9	50.0	57.0
1877.....	54.6	56.0	58.0	55.0	59.4	65.1	64.3	61.8	64.4	56.9	57.6	51.3	58.7
1878.....	51.6	52.0	54.0	55.8	58.4	58.7	60.8	59.6	59.7	61.3	54.7	50.3	56.4
1879.....	48.2	53.3	56.4	57.5	57.5	57.8	57.8	60.3	60.2	56.5	51.7	49.5	55.6
1880.....	46.7	47.1	48.4	53.9	58.5	55.9	57.1	58.8	56.9	57.4	51.5	52.2	53.7
1881.....	52.5	54.0	53.9	57.5	59.4	61.7	62.9	59.9	58.0	50.0	49.2	46.8	55.5
1882.....	44.0	44.9	52.4	54.7	62.8	60.8	63.0	59.5	60.1	54.9	49.2	50.9	54.8
1883.....	44.3	48.0	54.3	54.9	68.2	64.4	62.5	61.9	62.0	56.0	50.3	49.4	56.4
1884.....	46.5	49.3	53.9	56.4	63.3	63.9	63.4	63.1	61.4	58.9	52.7	49.0	56.8
1885.....	47.6	49.0	58.7	61.0	61.3	61.7	63.4	61.2	62.4	54.0	54.9	49.8	56.6
1886.....	47.9	52.0	49.8	55.2	61.8	58.4	62.7	66.1	63.5	56.5	49.2	51.8	56.2
1887.....	47.7	45.2	55.1	54.6	60.5	64.2	60.1	59.3	60.3	61.1	51.3	45.8	55.4
1888.....	44.1	49.7	48.6	56.2	58.1	68.4	66.2	60.3	59.3	57.3	50.8	52.2	55.9
1889.....	44.0	47.8	58.9	57.8	59.0	60.1	60.3	60.0	65.0	58.4	53.6	51.2	55.9
1890.....	48.9	46.2	51.7	55.7	57.5	58.8	63.1	60.4	60.8	59.9	50.8	49.3	54.8
1891.....	47.6	47.1	52.7	53.1	57.9	64.5	63.1	61.7	57.9	52.9	51.7	44.6	55.0
1892.....	47.5	50.5	53.4	57.3	64.4	62.1	63.4	62.6	59.8	53.0	49.5	47.5	55.9
1893.....	47.1	45.1	47.7	50.0	61.2	64.6	63.9	64.8	63.1	56.6	56.9	49.7	55.9
1894.....	47.9	49.6	50.6	51.6	54.7	60.2	63.6	64.7	63.1	56.3	53.0	49.5	55.4
1895.....	46.5	53.9	55.9	58.4	62.1	63.3	63.4	60.4	61.7	58.0	50.3	45.5	56.6
1896.....	51.8	51.8	52.7	48.3	58.5	55.3	60.5	63.4	62.0	56.3	51.1	47.7	55.0
1897.....	44.7	43.9	44.1	58.7	61.0	67.6	65.8	65.6	63.1	59.2	50.6	48.2	56.0
1898.....	45.4	55.2	53.4	58.0	55.7	63.2	63.3	64.0	61.0	61.7	51.8	46.4	56.6
1899.....	50.6	52.4	54.1	58.3	60.8	61.4	66.5	60.4	58.6	55.5	60.5	58.6	58.1
Mean.....	47.7	50.1	52.5	55.7	59.9	61.9	62.6	61.6	61.1	57.1	52.6	49.5	56.0

## CLIMATOLOGY OF CALIFORNIA.

## MINIMUM TEMPERATURE (DEGREES FAHRENHEIT)

Year.	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1872	..	..	..	..	47	54	56	52	47	36	32	22
1873	36	30	36	..	..	..	58	52	46	30	35	36
1874	31	32	33	43	45	50	52	52	48	46	33	23
1875	28	32	32	33	48	49	52	51	50	39	38	31
1876	30	30	32	40	44	40	51	52	51	42	35	31
1877	21	25	37	44	47	52	54	54	50	35	34	34
1878	30	28	37	41	48	51	51	52	50	42	30	26
1879	26	29	32	44	45	52	52	53	50	42	30	20
1880	25	25	32	41	44	49	52	52	45	41	28	38
1881	32	36	32	45	45	52	52	51	44	31	29	33
1882	22	28	32	42	44	58	53	52	50	40	30	28
1883	20	24	44	40	45	53	54	52	50	38	29	32
1884	30	25	34	44	50	54	53	54	45	37	40	26
1885	33	32	36	41	50	51	54	57	46	38	30	32
1886	29	38	35	38	49	51	52	54	46	39	31	32
1887	28	29	33	40	44	50	48	53	47	42	28	32
1888	22	35	30	42	51	51	54	52	47	40	31	38
1889	28	30	43	48	50	51	53	52	48	44	33	35
1890	30	30	38	47	48	50	53	55	52	42	40	40
1891	30	32	42	44	48	55	54	54	46	40	40	25
1892	32	38	42	47	48	54	55	52	52	34	36	30
1893	36	32	38	42	54	55	56	52	55	40	39	35
1894	26	34	37	40	45	50	54	52	50	44	38	32
1895	32	38	40	48	49	52	50	50	50	42	35	30
1896	29	36	37	35	45	40	45	53	52	45	32	36
1897	36	35	35	40	50	52	50	51	50	40	32	25
1898	27	31	32	43	45	51	50	52	50	49	31	27
1899	27	31	40	48	50	50	55	50	45	40	40	33
Absolute minimum and date	{ 20 1883 }	24 1883	30 1888	33 1875	44 (a)	{ 40 1876 1896 }	43 1887	{ 50 1895 1899 }	44 1881	30 1873	{ 28 1880 1887 }	20 1879

## MAXIMUM TEMPERATURE (DEGREES FAHRENHEIT)

Year.	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1872	..	..	..	..	84	90	71	79	80	87	82	80
1873	76	70	84	..	90	..	78	79	76	87	84	66
1874	66	66	70	70	82	79	77	76	88	85	75	73
1875	66	71	78	80	77	78	70	76	77	79	70	68
1876	62	69	73	79	68	79	76	75	82	76	81	76
1877	77	73	70	64	70	88	76	79	87	79	78	69
1878	67	63	74	72	70	71	70	71	76	85	78	80
1879	64	72	80	70	75	78	72	87	80	90	75	71
1880	74	64	65	64	87	76	72	70	71	86	83	70
1881	68	75	78	76	73	74	86	70	78	70	74	72
1882	65	66	76	70	72	71	72	73	74	81	75	76
1883	66	81	84	68	85	94	74	78	96	76	75	75
1884	65	76	72	72	80	72	75	76	75	84	80	66
1885	70	75	82	82	76	73	73	76	82	72	72	74
1886	68	73	68	75	77	71	76	78	88	69	80	78
1887	70	72	82	70	70	78	72	70	78	92	78	66
1888	63	74	70	79	74	75	84	76	74	82	77	67
1889	64	76	77	76	87	75	78	75	88	94	78	65
1890	59	63	67	34	80	67	71	68	70	95	60	62
1891	62	62	65	64	76	90	90	90	70	65	68	64
1892	62	62	70	75	95	75	85	80	72	68	68	62
1893	58	62	70	62	70	75	80	80	74	76	70	65
1894	63	62	65	65	78	80	85	94	87	92	80	68
1895	62	78	72	73	90	92	78	80	91	70	88	63
1896	68	78	70	68	95	80	78	76	75	80	68	65
1897	55	62	60	82	85	90	92	86	81	75	70	68
1898	68	77	68	80	70	90	76	75	80	87	77	72
1899	72	75	75	76	75	79	76	76	81	94	72	75
Absolute maximum and date	{ 77 1877 }	81 1883	{ 84 1873 1883 }	84 1890	{ 95 1892 1896 }	94 1883	92 1897	94 1894	96 1883	95 1890	88 1895	{ 80 1872 1878 }

a Several years

## LOCAL CLIMATOLOGY.

151

## MONTHLY AND ANNUAL PRECIPITATION (INCHES AND HUNDREDTHS).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1873.....	3.40	2.12	0.80	0.00	0.00	0.00	0.00	0.00	0.10	0.10	0.20	4.25	10.97
1874.....	3.42	1.03	2.15	0.95	0.00	0.00	0.00	0.00	0.00	1.83	1.42	0.00	10.80
1875.....	4.50	0.15	0.40	1.42	0.00	0.26	0.00	0.00	0.14	0.00	5.17	1.98	14.02
1876.....	6.16	3.55	4.52	1.42	T.	0.00	0.00	0.00	0.05	1.04	0.05	T.	16.79
1877.....	2.54	0.16	0.30	0.10	0.20	0.00	T.	T.	0.00	0.12	1.00	2.39	6.81
1878.....	7.05	8.77	2.57	1.92	T.	0.00	0.00	T.	0.05	0.60	0.20	0.35	21.51
1879.....	2.42	2.81	1.85	1.69	0.82	0.15	0.00	0.00	T.	1.05	1.08	2.28	14.15
1880.....	1.65	1.16	1.64	3.90	0.46	0.00	0.00	0.00	0.00	T.	0.57	5.56	14.94
1881.....	3.32	2.32	1.26	0.66	0.00	0.38	0.00	0.00	0.10	0.28	0.67	1.24	10.23
1882.....	1.78	2.31	4.86	1.01	0.49	0.19	0.00	0.00	0.38	1.43	0.65	0.90	14.00
1883.....	0.91	0.95	2.26	1.28	1.98	0.00	0.00	0.00	0.19	1.19	0.25	1.95	10.96
1884.....	1.70	4.49	5.09	3.05	0.72	2.66	0.00	0.18	0.11	1.79	0.28	4.46	24.53
1885.....	1.09	0.05	0.19	1.21	0.12	0.00	0.05	0.00	0.02	0.08	6.60	1.80	10.71
1886.....	5.10	1.47	2.16	3.83	0.20	0.00	T.	0.00	0.00	0.62	0.82	0.72	14.92
1887.....	0.75	4.73	0.54	1.63	0.07	0.00	0.00	0.00	0.71	0.00	0.98	2.16	11.57
1888.....	4.15	0.53	3.23	0.00	0.89	0.00	0.00	0.00	0.56	0.00	1.64	2.20	13.25
1889.....	0.65	1.65	3.33	0.95	0.68	0.00	0.00	0.00	0.00	4.20	2.41	8.72	22.59
1890.....	6.19	3.03	1.79	0.60	0.65	0.00	0.00	T.	0.29	0.00	0.44	2.05	15.04
1891.....	0.75	4.28	1.05	2.93	0.40	0.00	0.00	0.00	0.12	0.30	0.20	5.40	15.43
1892.....	0.48	1.48	2.78	0.88	1.29	0.00	0.00	0.00	0.16	0.86	2.26	4.30	14.49
1893.....	0.98	2.98	5.12	1.25	0.17	0.00	0.00	0.00	0.30	0.02	0.63	1.53	12.93
1894.....	5.07	3.30	0.58	0.45	1.53	0.29	0.00	0.00	0.95	1.06	0.45	4.95	18.63
1895.....	5.05	1.33	2.07	0.94	0.45	0.00	0.00	0.00	0.00	0.37	1.00	0.88	12.09
1896.....	5.80	0.00	1.50	2.40	0.47	0.00	0.00	0.36	0.00	1.20	2.64	1.75	16.12
1897.....	0.55	3.07	3.80	0.35	0.00	0.30	0.00	0.00	0.55	1.45	0.43	0.82	11.32
1898.....	0.73	1.58	0.91	0.22	1.08	0.30	0.00	0.00	0.14	0.27	0.31	1.40	6.94
1899.....	3.94	0.50	4.19	0.72	0.71	0.00	0.00	0.00	0.00	1.14	2.77	1.62	15.59
Average.....	2.97	2.21	2.26	1.32	0.50	0.17	T.	0.02	0.18	0.78	1.30	2.41	14.12

## SALTON.

[Data from records of Southern Pacific Railway Company.]

Salton is situated in the Colorado Desert, near the southern line of Riverside County, on the borders of Salton or Old Dry Lake, about 100 miles northwest of Yuma, and is 263 feet below sea level. The highest temperature in the past four years was 126°, July 13, 1900, and the lowest 20°, December 16, 1897. The total rainfall in the last twelve years was only 30.77 inches, an average of 2.56 inches annually.

## MONTHLY AND ANNUAL MEAN TEMPERATURE (DEGREES FAHRENHEIT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1889.....	64.0	67.9	67.8	79.8	79.2	92.5	95.3	95.6	80.9	74.2	61.9	57.5	76.9
1890.....	50.4	57.3	65.4	73.4	81.7	88.6	97.2	89.3	87.9	72.6	62.7	58.2	73.7
1891.....	53.5	53.3	66.9	73.0	78.7	86.9	97.1	96.1	86.7	77.3	62.4	53.2	73.3
1892.....	53.2	59.3	66.9	73.5	82.8	88.3	94.6	96.5	92.9	81.0	70.3	57.8	76.5
1893.....	58.4	60.7	66.1	77.5	79.2	95.9	98.7	98.9	90.7	79.4	70.7	66.3	78.5
1894.....	53.2	54.6	68.6	80.4	84.1	90.3	100.1	99.3	91.4	82.7	68.3	54.2	77.2
1895.....	50.9	60.2	67.8	80.1	90.1	96.4	96.5	97.9	91.4	82.7	69.9	60.2	73.7
1896.....	63.6	65.6	69.4	74.0	84.1	100.6	101.2	98.2	87.3	85.3	70.8	56.4	79.7
1897.....	54.0	53.8	59.2	79.1	94.0	98.6	107.0	107.4	99.0	79.0	68.7	52.5	79.4
1898.....	49.1	49.6	57.8	82.1	73.3	93.7	100.0	98.4	92.4	78.0	59.1	46.2	73.3
1899.....	51.9	57.7	62.6	75.2	76.6	94.0	102.1	95.8	99.9	78.1	69.6	57.8	76.8
1900.....	65.7	65.9	74.0	70.3	98.5	99.4	97.0	92.9	85.8	78.9	67.3	53.0	73.7
Means (12 years).....	55.7	58.8	66.0	76.5	83.1	93.8	98.9	97.2	91.0	79.1	66.8	56.1	76.9

## MONTHLY AND ANNUAL PRECIPITATION (INCHES AND HUNDREDTHS)

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1889 . . . . .	0 49	5 12	1 21	0 00	0 00	0 00	0 00	0 30	0 00	0 15	0 13	3 79	11 19
1890 . . . . .	0 00	0 00	0 00	0 00	0 00	0 00	0 60	0 37	1 35	0 00	0 00	0 32	2 64
1891 . . . . .	0 00	1 87	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	1 87
1892 . . . . .	2 75	0 43	0 60	0 00	0 10	0 00	0 00	0 00	0 00	0 00	0 00	0 00	3 88
1893 . . . . .	0 00	0 00	0 22	0 00	0 70	0 00	0 76	0 00	0 12	0 00	0 71	T	2 51
1894 . . . . .	0 00	0 00	0 00	0 00	0 00	0 00	0 23	0 00	0 00	T	0 00	1 30	1 53
1895 . . . . .	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	T	T	0 00	T
1896 . . . . .	T	0 00	0 00	0 00	0 00	0 00	0 18	0 51	0 00	0 93	0 46	0 62	2 70
1897 . . . . .	1 17	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 05	0 00	0 00	0 00	1 22
1898 . . . . .	0 45	0 00	0 35	0 00	0 00	T	0 00	T	0 00	0 00	0 00	0 59	1 39
1899 . . . . .	0 30	0 00	0 00	0 00	0 00	0 00	0 00	0 45	0 00	0 14	0 11	T	1 00
1900 . . . . .	0 00	0 00	0 12	0 02	0 00	0 00	0 50	0 00	0 00	0 20	0 00	0 00	0 84
Average (12 years) . .	0 43	0 62	0 21	T	0 07	T	0 19	0 14	0 13	0 12	0 12	0 55	2 56

## SAN BERNARDINO

By Dr A. K. JOHNSON, Voluntary Observer

Quoting from Professor Davis, of Harvard College: "The average value of the atmospheric conditions of a region constitutes its climate. The most important climatic elements are, first, temperature; second, various forms of moisture, as vapor, cloudiness, and precipitation; then, wind in cyclonic storms. The pressure of the atmosphere is not a climatic element and needs not to be considered only with the division of the wind system."

Taking up the study of San Bernardino climate under this division, the following tables will show the average temperature by months for the past nine years, together with the highest and lowest record and years in which it occurred.

## MEAN MONTHLY AND ANNUAL TEMPERATURE (DEGREES FAHRENHEIT)

Year	Jan.	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1892 . . . . .	52.9	53.4	56.5	59.0	64.4	67.7	73.5	75.0	70.6	61.4	57.8	50.4	61.9
1893 . . . . .	53.9	52.6	53.8	58.8	64.1	71.0	72.3	75.6	67.0	61.0	54.0	49.7	61.3
1894 . . . . .	47.0	47.8	54.0	60.3	62.8	65.8	74.6	75.4	70.4	64.6	60.0	52.0	61.0
1895 . . . . .	47.7	54.2	55.4	59.2	66.3	70.4	76.0	74.0	69.8	64.6	56.3	51.0	62.1
1896 . . . . .	54.2	56.4	58.0	56.0	64.2	73.4	76.8	75.2	70.4	65.4	56.0	54.5	63.4
1897 . . . . .	50.8	49.7	51.2	62.0	66.0	69.0	74.8	77.4	71.3	60.3	56.6	50.2	61.6
1898 . . . . .	46.7	56.2	52.5	63.9	61.8	70.8	76.0	78.6	72.6	64.4	56.2	50.6	62.5
1899 . . . . .	52.7	53.4	54.3	61.2	60.4	70.0	75.3	71.4	75.8	62.4	58.8	54.2	62.5
Mean . . . . .	50.7	53.0	54.5	60.0	63.7	69.8	74.9	75.3	71.0	63.0	57.0	51.6	62.0

## HIGHEST AND LOWEST TEMPERATURE (DEGREES FAHRENHEIT)

Month	Highest		Lowest		Month	Highest		Lowest	
	Date	Temperature	Date	Temperature		Date	Temperature	Date	Temperature
January . . . . .	1898	83	1895	23	August . . . . .	1898	108	1899	42
February . . . . .	<sup>a</sup> 1896	85	1891	24	September . . . . .	1899	<sup>d</sup> 110	<sup>e</sup> 1893	42
March . . . . .	<sup>b</sup> 1893	89	1898	27	October . . . . .	1899	100	1899	33
April . . . . .	1898	102	1896	30	November . . . . .	1898	92	<sup>f</sup> 1892	29
May . . . . .	1896	102	1899	33	December . . . . .	1895	84	1891	23
June . . . . .	1898	107	1894	40	Annual . . . . .	...	110	...	23
July . . . . .	1898	107	<sup>c</sup> 1891	47					

<sup>a</sup> Also in 1898<sup>b</sup> Also in 1896<sup>c</sup> Also in 1893, 1895, 1899<sup>d</sup> The cause of high temperature was an approaching thunderstorm, a very unusual occurrence<sup>e</sup> Also in 1894<sup>f</sup> Also in 1895, 1897

The daily variations are considerable, averaging 20°, sometimes running as high as 50°. This makes the nights always cool and pleasant, and the greatest variations are in the summer months. While the temperature is pretty high during the middle of the day, yet the dryness of

the atmosphere causes evaporation from the body, so the heat is not oppressive and sunstroke is unknown. Although it is more comfortable in the shade, yet the workmen are not bothered by the heat, as the writer observed some painters at work painting a tin roof without any serious inconvenience with the thermometer standing at 107° in the shade.

The temperature should be compared with the humidity table, which will show how dry the atmosphere is during the hottest part of the day.

The relative humidity was observed for three years, 1892, 1893, 1894. The following table will show the monthly average (per cent) at observations taken at 8 a. m., 12 m., and 8 p. m.:

Month.	Time of observation.			Mean.	Month.	Time of observation.			Mean.
	8 a. m.	12 m.	8 p. m.			8 a. m.	12 m.	8 p. m.	
January .....	69.6	45.3	67.5	60.8	August .....	73.2	44.5	65.6	61.1
February .....	77.9	54.6	77.7	70.1	September .....	71.6	41.5	68.2	60.4
March .....	76.5	58.8	79.2	71.5	October .....	73.3	48.3	74.4	65.3
April .....	71.8	45.8	74.9	64.1	November .....	68.7	42.0	69.0	59.9
May .....	77.1	53.0	76.8	68.9	December .....	77.2	56.3	72.7	68.9
June .....	71.8	45.1	68.5	61.8	Annual .....	72.9	47.8	71.4	64.0
July .....	65.8	38.7	62.2	55.5					

It will be seen that the mean at 8 a. m. averages 72.9 per cent and 71.4 per cent at 8 p. m., while at noon it averages 47.8 per cent. This explains why invalids should not be out of the house before 8 or 9 a. m. and be in the house before 8 p. m.

The rainfall each year is mostly during the winter months, although there are eight months that average over half an inch, the heaviest fall being in January. Instead of naming the seasons winter and summer, they are called the wet and dry seasons, but the season's rainfall is dated from July 1 and continues until the next June 30.

## MONTHLY AND ANNUAL PRECIPITATION (INCHES AND HUNDREDTHS).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1871.....	6.91	2.21	0.19	0.34	0.11	0.07	0.00	0.04	0.18	0.60	0.88	3.91	15.39
1872.....	0.00	2.20	0.37	0.79	0.06	0.00	0.00	0.18	0.04	0.00	1.17	4.40	9.21
1873.....	6.50	1.25	0.51	0.84	0.21	0.00	0.00	1.06	0.02	0.01	0.74	5.73	16.87
1874.....	5.51	3.76	1.08	0.48	0.42	0.00	0.00	0.00	0.06	1.82	1.88	2.20	22.21
1875.....	7.20	0.15	0.22	0.07	0.05	0.00	0.00	0.00	0.00	0.00	7.50	0.02	15.21
1876.....	6.55	1.92	3.41	0.44	0.03	0.03	0.00	0.00	0.00	0.20	0.40	0.00	12.98
1877.....	3.50	4.03	0.83	0.26	0.30	0.00	0.00	0.00	0.00	0.56	0.50	3.95	14.23
1878.....	3.33	6.68	2.57	1.71	0.66	0.07	0.07	0.00	0.02	0.14	0.05	4.70	20.00
1879.....	3.59	1.00	0.50	1.20	0.24	0.03	0.11	0.02	0.01	0.94	3.40	6.50	17.54
1880.....	1.56	1.33	1.45	5.00	0.04	0.00	0.00	0.00	0.00	0.14	0.67	3.80	18.99
1881.....	1.40	0.36	1.66	0.46	0.01	0.00	0.00	0.00	0.00	0.80	0.27	0.50	5.46
1882.....	1.11	2.65	3.30	2.91	0.00	0.00	0.00	0.00	0.00	0.10	0.15	0.45	10.67
1883.....	1.60	1.10	2.82	2.95	0.00	0.00	0.19	0.00	0.53	0.85	0.09	2.63	12.76
1884.....	1.63	12.20	9.95	5.68	3.17	0.59	0.00	0.00	0.00	0.00	0.11	3.75	37.08
1885.....	2.79	0.11	0.28	1.89	1.69	0.19	0.00	0.00	0.00	0.99	4.86	1.20	12.90
1886.....	6.44	2.52	4.18	2.36	0.32	0.16	0.00	0.00	0.00	0.00	0.11	0.61	16.70
1887.....	0.39	6.44	4.41	1.90	0.42	0.22	0.11	0.04	0.09	1.17	2.29	1.91	19.39
1888.....	4.01	3.60	3.41	0.58	0.52	0.03	0.00	0.00	0.00	0.05	4.12	4.64	20.96
1889.....	0.93	1.50	6.55	2.05	1.13	0.00	0.17	0.63	0.11	2.30	2.23	10.85	28.45
1890.....	5.44	2.52	0.89	0.00	0.31	0.00	0.13	2.16	0.88	0.58	1.27	3.02	17.20
1891.....	0.00	7.78	0.06	0.58	1.67	0.00	0.00	0.91	0.93	T.	T.	1.67	13.55
1892.....	3.24	3.30	1.75	0.37	2.10	0.08	0.00	0.00	0.00	0.16	1.02	2.23	14.25
1893.....	4.53	3.37	3.00	0.48	0.03	0.00	0.20	0.00	0.05	1.05	0.30	2.28	20.29
1894.....	1.26	0.88	1.15	0.40	0.56	0.00	0.00	0.16	0.37	0.15	0.60	7.25	12.13
1895.....	7.39	1.14	3.44	0.64	0.44	0.00	0.00	0.00	0.00	0.00	1.14	0.66	14.85
1896.....	2.02	0.00	2.92	0.37	1.00	0.00	T.	0.17	0.00	2.10	0.98	1.09	10.65
1897.....	3.40	5.40	3.41	0.03	0.11	0.00	T.	0.00	0.13	2.10	0.21	0.57	15.41
1898.....	2.10	0.60	0.97	0.48	1.08	0.00	0.00	0.00	0.00	0.03	0.05	0.44	5.75
1899.....	2.03	0.51	3.22	0.07	0.19	0.95	0.00	T.	0.01	0.81	1.47	0.84	10.10
Mean .....	3.32	2.95	2.53	1.22	0.58	0.08	0.03	0.19	0.12	0.60	1.29	2.99	15.59

The following table shows the average clear, fair, and cloudy days; also days on which 0.01 inch or more of rainfall occurred:

Month	Clear	Partly cloudy	Cloudy	Rainy	Month	Clear	Partly cloudy	Cloudy	Rainy
January . . . . .	18	6	7	7	August . . . . .	24	6	1	1
February . . . . .	17	7	4	5	September . . . . .	21	8	1	1
March . . . . .	13	12	6	7	October . . . . .	19	9	3	2
April . . . . .	19	9	2	3	November . . . . .	21	6	3	2
May . . . . .	19	9	3	2	December . . . . .	17	10	4	4
June . . . . .	24	6	0	1	Annual . . . . .	235	95	35	36
July . . . . .	23	7	1	1					

The prevailing direction of the wind is from the west and southwest in summer time; it drifts in from the ocean 60 miles away, greatly modifying the temperature. After the sun goes down a gentle breeze comes down from the mountains from the north and east, so that the air is hardly ever stagnant.

During the fall and winter north winds are frequent, but are regarded as beneficial in purifying the atmosphere, the same as thunderstorms in the East.

#### SANTA CRUZ

[Data from records of Mr RALPH SPRINGER and the Southern Pacific Railway Company ]

Santa Cruz, the county seat of Santa Cruz County, is an important city on Monterey Bay, about 80 miles south of San Francisco, in latitude  $37^{\circ}$  north, longitude  $122^{\circ} 02'$  west; elevation about 18 feet above sea level.

The mean annual temperature, based upon records covering twenty-eight years, is  $58.2^{\circ}$ , or about  $2^{\circ}$  higher than San Francisco. The warmest month is August, with a mean temperature above  $64^{\circ}$ , but June, July, and September all have temperatures exceeding  $63^{\circ}$ . The coolest month in the year is January, with a mean of  $51.1^{\circ}$ . It is apparent that the temperatures are very equable. The winter months are pleasant.

The average annual precipitation during the past twenty-three years is 26.97 inches, or nearly 4 inches more than the rainfall at San Francisco. December and January are the months of greatest rainfall, and more than half of the annual rainfall occurs during December, January, and February. The annual rainfall has varied from 13 inches to 44 inches. More than 20 inches of rain have fallen during eighteen of the twenty-three years.

## LOCAL CLIMATOLOGY.

155

## MONTHLY AND ANNUAL MEAN TEMPERATURE (DEGREES FAHRENHEIT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1873.....	56.0	51.9	57.0	58.9	62.4	64.7	63.2	66.0	61.3	58.4	55.3	53.2	59.0
1874.....	51.6	54.0	55.2	62.0	64.7	66.1	66.6	66.3	65.4	57.1	62.8	50.9	60.3
1875.....	50.0	54.4	49.5	60.4	65.2	64.4	64.3	68.7	63.3	59.8	58.5	56.7	59.5
1876.....	54.4	54.9	52.2	58.6	59.2	60.2	61.8	63.0	61.3	59.4	52.8	55.2	57.8
1877.....	56.4	57.6	60.6	61.7	60.2	63.3	64.3	64.7	63.3	59.8	55.6	52.8	60.0
1878.....	54.6	55.2	56.1	59.5	61.4	63.8	61.4	59.8	61.1	59.0	53.6	48.5	57.8
1879.....	46.7	54.9	57.4	57.9	58.8	62.5	64.5	65.5	64.5	60.4	53.2	48.2	57.9
1880.....	46.3	47.8	49.9	55.4	60.0	62.7	62.7	63.5	61.7	61.3	54.1	54.3	56.6
1881.....	54.1	57.9	58.2	62.9	63.9	62.9	64.5	66.8	60.8	57.4	54.9	52.1	59.7
1882.....	48.7	47.0	53.2	55.6	51.4	62.3	64.0	63.7	62.2	60.0	54.1	53.6	56.3
1883.....	49.1	49.7	56.4	56.8	59.5	65.4	64.7	64.2	65.5	58.7	54.9	54.1	58.2
1884.....	52.5	53.5	55.7	57.7	62.6	63.9	65.1	66.1	62.6	60.1	56.3	52.7	59.1
1885.....	52.7	54.5	58.6	60.6	62.4	64.5	66.6	65.6	64.7	62.5	58.4	53.2	60.4
1886.....	53.6	57.8	53.7	57.8	62.4	66.4	66.6	65.0	59.7	56.7	55.7	54.9	59.2
1887.....	52.2	49.3	58.2	57.7	59.7	63.9	61.9	62.3	65.1	64.4	55.7	53.0	58.6
1888.....	49.2	53.1	54.8	59.3	59.3	67.6	66.4	64.4	65.8	66.3	58.0	57.1	60.1
1889.....	50.9	52.9	56.3	59.7	59.3	63.6	67.1	65.2	67.5	61.9	55.9	55.0	59.4
1890.....	49.6	52.0	54.5	58.1	62.6	61.9	69.5	68.3	68.1	61.2	57.0	53.1	59.7
1891.....	49.2	50.6	53.4	54.7	57.8	63.5	63.8	66.2	61.8	58.9	54.7	50.4	57.1
1892.....	50.5	52.4	53.9	55.4	58.0	60.1	61.8	61.6	61.1	58.0	53.7	49.7	56.4
1893.....	50.2	49.4	51.9	54.6	58.5	60.5	62.6	63.1	60.8	58.0	56.0	54.0	56.6
1894.....	48.8	49.4	52.3	58.1	59.2	62.0	63.8	65.4	64.6	61.4	53.7	54.2	53.2
1895.....	50.8	54.8	54.9	57.2	61.0	62.5	64.1	62.8	64.2	61.2	55.3	50.7	53.3
1896.....	53.0	55.2	55.0	53.1	57.2	60.6	63.9	64.8	61.3	58.3	52.6	53.4	57.4
1897.....	49.5	50.2	49.2	57.6	59.3	62.8	61.9	63.0	63.7	55.6	51.7	49.4	56.2
1898.....	46.0	52.5	51.6	57.4	55.8	63.2	62.0	63.5	62.8	61.2	53.0	48.2	56.4
1899.....	51.8	50.4	50.6	55.2	53.6	58.6	60.0	62.0	61.3	56.0	55.4	49.6	55.4
1900.....	53.0	52.4	55.8	53.8	59.4	62.1	60.7	62.8	62.4	57.8	55.5	50.2	57.2
Mean (28 years) .....	51.1	52.7	54.5	57.8	59.8	63.1	63.9	64.5	63.1	59.7	55.5	52.4	58.2

## MONTHLY AND ANNUAL PRECIPITATION (INCHES AND HUNDREDTHS).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1873.....	10.56	14.71	4.04	2.06	0.00	0.00	0.00	0.00	1.27	2.75	0.30	1.34	37.03
1879.....	4.79	4.42	3.64	2.14	1.41	0.05	0.00	0.00	0.00	1.06	3.76	2.50	23.77
1880.....	1.44	1.04	2.12	5.60	0.70	0.00	0.00	0.00	0.00	0.00	0.40	12.59	23.89
1881.....	9.38	3.28	1.74	2.26	0.00	0.99	0.00	0.00	0.39	1.64	0.96	5.58	26.22
1882.....	3.08	3.04	5.57	2.26	0.24	0.07	0.00	0.00	0.65	2.47	2.28	1.41	21.07
1883.....	3.57	0.76	3.65	1.03	3.13	0.02	0.00	0.00	0.54	1.42	0.95	1.07	16.79
1884.....	3.30	5.27	3.76	6.78	0.11	2.48	0.00	0.10	0.33	1.37	0.32	3.91	37.73
1885.....	2.11	0.41	0.47	2.43	0.05	0.00	0.08	0.00	0.07	0.10	10.25	2.90	13.87
1886.....	7.60	0.80	3.05	7.60	0.30	0.00	0.00	0.00	0.00	0.79	1.10	2.20	23.44
1887.....	1.01	9.62	0.53	1.90	0.02	0.00	0.00	0.00	0.42	0.42	1.21	4.58	19.71
1888.....	8.00	1.93	4.61	0.57	1.08	0.09	0.00	0.00	0.37	0.00	6.17	5.07	27.89
1889.....	0.99	1.37	0.76	0.84	1.78	0.00	0.00	0.00	0.00	9.50	2.64	20.38	44.26
1890.....	9.40	4.90	5.58	1.06	1.22	0.00	0.00	0.00	0.80	0.00	0.00	2.34	25.30
1891.....	0.77	10.68	1.35	2.57	0.60	0.10	0.00	0.00	0.70	0.45	0.58	8.10	25.90
1892.....	1.40	4.60	2.82	1.83	3.95	0.00	0.00	0.00	0.25	0.93	5.05	7.15	27.98
1893.....	5.30	4.25	9.95	1.65	0.36	T.	0.00	0.00	0.25	0.75	4.40	3.50	30.41
1894.....	7.02	8.60	1.64	0.66	2.36	0.72	0.01	T.	2.77	3.59	0.40	13.71	41.48
1895.....	9.11	4.07	3.08	2.02	1.15	0.00	0.00	0.00	0.18	0.49	1.89	2.15	24.14
1896.....	3.62	0.25	3.69	3.07	1.66	T.	0.05	0.73	0.35	1.88	6.79	4.87	31.86
1897.....	3.72	4.96	4.86	0.22	0.24	0.10	0.00	T.	0.17	1.49	0.54	2.13	13.43
1898.....	2.17	2.67	1.39	0.52	1.35	0.06	0.00	T.	2.21	0.40	0.86	2.24	13.37
1899.....	7.27	0.45	9.31	1.21	0.95	0.14	0.00	0.05	0.00	7.05	3.70	4.42	34.55
1900.....	5.49	0.99	3.58	2.21	0.94	T.	T.	T.	0.13	2.11	7.87	2.43	25.80
Average (23 years) .....	5.04	4.05	4.01	2.31	1.03	0.21	0.01	0.04	0.52	1.77	2.71	5.29	26.97

## STOCKTON

The city of Stockton, latitude  $37^{\circ} 52'$ , longitude  $121^{\circ} 18'$  west, lies about 60 miles east of San Francisco. As the center of the great wheat belt of California, a record of the temperature and rainfall conditions is of the highest importance. Rainfall data covering a period of forty-nine years are available, but it is not known definitely to whom credit should be given for these records. On the books of the Weather Bureau are found the names of Dr. R. R. Reed, W. M. Trivett, M. Walthal, and T. G. Brown. Doubtless there are others to whom credit should be given.

MONTHLY AND ANNUAL MEAN TEMPERATURE (DEGREES FAHRENHEIT), 1871-1900

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1871. . . . .	46.9	49.2	57.0	60.1	64.6	74.4	73.5	74.7	70.7	63.5	52.5	49.2	61.4
1872. . . . .	49.1	54.1	56.6	57.3	67.7	72.6	75.6	77.7	71.2	64.4	54.2	46.5	62.2
1873. . . . .	51.8	47.7	57.7	58.3	68.6	69.6	76.1	72.0	72.2	58.3	56.5	47.1	60.9
1874. . . . .	46.0	48.6	52.4	59.7	65.7	71.8	77.7	74.3	75.2	68.8	57.3	47.0	62.0
1875. . . . .	48.4	54.0	54.4	62.6	71.7	72.8	74.2	72.5	70.6	69.9	56.6	50.0	63.1
1876. . . . .	45.1	50.5	55.2	60.6	65.0	77.3	75.6	72.0	69.9	63.5	53.5	45.5	61.1
1877. . . . .	48.2	54.9	61.5	62.9	67.2	71.9	77.6	75.6	72.8	62.0	55.8	48.9	63.3
1878. . . . .	48.3	50.9	54.1	56.7	62.0	69.0	72.5	69.2	67.6	60.5	53.6	46.0	59.2
1879. . . . .	44.1	54.0	56.6	57.1	58.1	70.2	71.0	74.1	68.2	60.0	50.2	45.4	59.1
1880. . . . .	44.4	45.4	48.8	54.2	60.6	65.1	70.5	67.6	70.0	62.0	49.0	50.0	57.6
1881. . . . .	48.7	53.7	57.7	63.6	67.4	65.7	70.9	68.0	67.2	56.7	50.9	44.2	59.6
1882. . . . .	43.0	47.0	54.0	60.4	66.5	67.8	74.2	74.2	68.6	55.5	50.0	48.2	59.1
1883. . . . .	43.2	46.1	54.8	52.8	61.0	70.0	72.3	70.6	72.0	56.0	46.9	46.0	57.6
1884. . . . .	46.4	45.9	53.1	57.8	63.1	64.1	69.9	71.6	63.0	59.4	54.7	48.6	58.1
1885. . . . .	47.9	53.5	57.8	61.3	64.0	67.1	69.4	73.1	68.4	62.6	55.3	50.8	60.9
1886. . . . .	48.1	54.1	53.1	57.4	63.8	72.0	74.6	73.1	68.2	59.0	51.0	50.9	60.4
1887. . . . .	48.5	45.9	58.0	59.5	64.0	68.2	70.3	68.4	68.5	63.9	53.4	46.7	59.6
1888. . . . .	44.3	51.1	53.6	62.3	62.0	68.1	71.1	74.9	72.3	62.2	53.3	49.6	60.4
1889. . . . .	45.1	49.2	55.3	60.5	62.9	70.9	72.3	73.2	74.7	64.9	62.2	55.6	62.3
1890. . . . .	46.2	50.2	51.6	59.3	67.3	70.9	74.1	76.0	56.3	64.0	63.9	45.0	60.4
1891. . . . .	47.1	47.4	55.3	62.1	65.4	71.5	79.6	77.0	71.6	65.5	56.1	47.4	62.2
1892. . . . .	47.0	52.1	54.4	55.7	63.9	66.8	71.1	72.4	67.4	60.6	53.8	47.4	59.4
1893. . . . .	42.5	47.8	52.6	55.6	64.2	68.4	74.3	73.4	64.7	58.0	53.0	48.0	58.5
1894. . . . .	44.1	46.2	52.2	60.0	63.6	64.4	73.0	73.0	70.0	61.7	55.6	46.4	59.2
1895. . . . .	45.6	52.2	53.2	57.8	62.6	71.4	71.3	71.7	65.2	63.0	50.8	43.9	58.2
1896. . . . .	49.2	52.8	55.4	53.4	59.8	70.3	75.2	71.2	66.7	63.0	50.9	48.2	59.7
1897. . . . .	48.6	43.6	51.4	64.6	70.5	73.9	75.0	71.2	68.1	59.2	49.3	43.6	59.9
1898. . . . .	40.5	51.8	51.2	61.3	60.5	69.4	69.4	71.4	67.9	61.4	51.6	42.0	58.2
1899. . . . .	43.3	50.4	52.6	57.8	58.6	71.0	72.1	67.2	71.2	59.4	53.8	43.6	58.8
1900. . . . .	47.2	50.1	54.8	52.8	63.8	69.3	73.7	72.3	69.2	63.4	60.2	42.8	60.0
Mean . . . . .	46.5	50.0	54.5	58.9	64.1	69.9	72.6	72.5	69.0	61.7	53.9	47.1	60.1



## LOCAL CLIMATOLOGY.

157

MONTHLY AND ANNUAL PRECIPITATION (INCHES AND HUNDREDTHS), 1850-1900.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1850.....	4.50	0.50	10.00	4.25	0.25	0.00	0.00	0.00	0.00	0.00	T.	T.	19.50
1851.....	0.65	0.35	1.88	1.14	0.69	0.00	0.00	0.00	1.00	0.18	2.14	7.07	15.10
1852.....	0.58	0.12	6.40	0.19	0.30	0.00	0.00	0.00	T.	0.00	6.00	13.41	27.00
1853.....	2.40	0.62	2.02	2.70	0.25	0.00	0.00	0.00	0.00	0.00	0.61	1.35	9.95
1854.....	2.64	8.94	8.60	3.24	0.66	0.00	0.00	0.00	0.00	0.13	0.31	0.23	19.75
1855.....	2.90	2.74	2.20	3.29	0.00	0.00	0.00	0.00	0.00	0.00	0.74	2.42	14.29
1856.....	4.50	0.02	0.26	0.16	0.17	0.00	0.10	0.00	0.00	0.45	0.83	2.90	9.39
1857.....	1.38	4.80	0.68	T.	T.	0.35	0.00	T.	0.00	0.66	2.41	6.63	16.91
1858.....	2.44	2.46	2.88	1.21	0.20	0.10	0.00	T.	T.	3.01	0.15	4.33	16.78
1859.....	0.96	3.91	1.64	0.98	1.04	0.00	0.03	0.00	0.02	0.00	6.48	1.83	16.89
1860.....	2.31	0.93	5.11	2.87	2.49	0.11	0.55	0.00	0.06	0.91	0.18	4.28	19.80
1861.....	2.67	2.92	3.32	0.48	0.59	0.14	0.00	0.00	0.00	T.	2.17	8.64	20.93
1862.....	15.04	4.26	2.80	0.82	1.81	0.01	0.00	0.01	0.00	0.36	0.01	2.33	27.45
1863.....	1.73	2.75	2.36	1.09	0.36	0.00	0.00	0.00	T.	0.00	1.49	1.82	12.20
1864.....	1.08	0.18	1.30	1.08	0.74	0.09	0.00	0.08	T.	0.12	6.72	7.87	19.26
1865.....	4.78	0.71	0.48	1.37	0.46	0.00	T.	0.00	0.08	0.48	2.43	0.36	11.15
1866.....	7.70	2.01	2.02	0.48	2.25	0.10	0.02	0.00	0.00	T.	2.43	9.51	26.52
1867.....	3.44	7.10	1.01	1.80	0.01	0.00	0.00	0.00	0.03	0.62	2.16	6.48	22.65
1868.....	5.07	2.28	3.51	0.56	0.00	0.00	0.00	0.00	0.00	0.13	0.62	3.45	15.62
1869.....	4.18	3.17	2.49	1.59	0.82	0.00	0.00	0.00	0.00	1.05	0.83	1.55	15.68
1870.....	0.37	2.35	0.99	0.07	0.12	0.31	0.00	0.00	0.00	0.15	0.67	1.35	6.38
1871.....	1.47	1.70	0.30	0.69	0.40	T.	T.	0.00	0.00	0.14	1.09	11.49	17.28
1872.....	2.58	3.46	1.43	0.51	0.06	0.04	0.00	0.00	0.00	0.03	1.37	6.25	15.73
1873.....	0.75	3.97	0.47	0.44	0.00	0.00	0.03	0.00	0.00	0.31	0.76	3.94	10.67
1874.....	3.94	1.78	3.33	0.50	0.58	0.00	0.00	0.00	0.23	1.09	3.45	0.23	15.19
1875.....	4.54	0.28	0.87	0.00	0.00	0.45	0.00	0.00	0.00	0.01	5.86	2.85	14.86
1876.....	3.26	2.65	3.23	0.40	0.00	0.00	0.07	0.00	0.00	2.11	0.30	0.00	12.02
1877.....	3.32	0.23	0.75	0.00	0.32	0.00	0.00	0.00	0.00	0.36	0.72	1.31	7.01
1878.....	5.45	6.70	2.56	1.01	0.65	0.00	0.00	0.00	0.00	0.34	0.51	0.42	17.64
1879.....	2.28	2.94	2.06	1.75	0.96	0.20	0.00	0.00	0.00	0.58	2.05	1.67	14.49
1880.....	1.54	1.32	0.89	6.28	1.01	0.00	0.00	0.00	0.00	0.00	0.04	7.09	18.17
1881.....	2.83	2.50	0.82	1.11	0.29	0.00	0.00	0.00	T.	0.24	0.73	1.65	10.17
1882.....	1.27	0.84	2.64	2.21	0.00	0.11	0.00	0.00	0.50	1.86	1.11	0.27	10.81
1883.....	2.55	0.35	2.55	1.23	4.84	0.00	0.00	0.00	0.18	0.93	0.51	1.00	14.14
1884.....	1.94	4.43	6.66	2.94	0.50	1.27	0.00	0.00	0.19	1.40	0.00	5.69	25.02
1885.....	1.23	0.00	0.26	0.77	0.00	0.05	0.00	0.03	0.00	0.00	6.08	1.24	9.66
1886.....	5.36	0.04	1.21	3.43	0.00	0.00	0.00	0.00	0.00	0.22	0.84	0.82	11.92
1887.....	0.36	3.78	0.21	1.57	0.00	0.03	0.00	0.00	0.27	0.00	0.52	3.06	9.80
1888.....	3.36	0.43	2.29	0.28	0.55	0.00	0.00	0.00	0.88	0.00	2.70	2.42	12.96
1889.....	0.31	0.98	3.98	0.14	1.52	0.06	0.00	0.00	0.00	* 3.39	3.27	6.17	19.82
1890.....	4.99	1.66	1.26	1.08	0.55	0.00	0.00	0.00	0.57	0.00	0.00	2.31	12.42
1891.....	0.95	3.19	1.14	1.58	0.30	0.05	0.00	0.00	0.20	0.05	0.07	4.58	12.11
1892.....	0.95	1.25	2.50	0.81	1.44	0.36	0.00	T.	0.08	0.79	3.66	2.99	14.83
1893.....	2.68	2.14	2.59	0.96	0.00	0.00	T.	0.00	0.13	0.00	2.38	1.42	12.30
1894.....	3.88	4.93	0.45	0.10	1.84	0.70	0.00	0.00	1.76	1.32	0.56	6.80	22.34
1895.....	5.24	1.70	1.00	0.63	0.77	0.00	0.00	0.00	0.50	0.26	1.09	1.20	12.39
1896.....	6.09	0.19	1.76	2.65	0.96	0.00	T.	0.19	T.	1.11	2.30	1.12	16.37
1897.....	1.81	2.85	2.78	0.37	0.09	T.	0.00	0.01	0.03	1.37	0.39	1.23	10.93
1898.....	0.61	1.32	0.84	T.	1.11	0.03	0.00	0.00	0.35	0.88	0.56	1.50	7.20
1899.....	3.15	0.18	6.58	0.58	0.47	0.20	0.00	0.05	0.00	3.59	2.90	1.83	19.43
1900.....	2.39	0.24	1.73	1.74	1.82	0.00	0.00	0.00	0.04	0.97	4.65	1.08	14.66
Mean.....	2.99	2.18	2.28	1.29	0.67	0.09	0.02	0.01	0.14	0.62	1.76	3.36	15.40

## TRUCKEE

[Data from records of Southern Pacific Railway Company]

Truckee is situated in Nevada County, about 8 miles southwest of Boca, in latitude  $39^{\circ} 20'$  north, longitude  $120^{\circ} 11'$  west. Trout Creek joins the Truckee River at this point. Donner Lake lies about 2 miles west of Truckee, just north of the boundary line between Nevada and Placer counties. The elevation of Truckee is 5,818 feet, and of Donner Lake 6,095 feet. The general movement of the air is from the southwest down the Truckee Valley, but owing to the topography of the country there are many local air movements. Killing frosts occur frequently, as at Boca, and low temperatures prevail during the winter months. The mean annual temperature at Truckee, based upon records covering thirty years, is  $43.9^{\circ}$ , and is almost identical with that of Boca for the same period. Truckee is somewhat warmer in July than Boca, and a little colder in the winter months. The average annual precipitation, based upon records covering thirty-one years, is 26.60 inches. The month of heaviest precipitation is January, with an average of 5.61 inches. The snowfall for the past four years is as follows. 1897, 218 inches; 1898, 110 inches; 1899, 246 inches; 1900, 132 inches.

MONTHLY AND ANNUAL MEAN TEMPERATURE (DEGREES FAHRENHEIT)

Year	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1871.....	24 6	28 3	32 0	39 0	44 2	56 0	73 1	67 1	61 2	44 1	32 8	27 1	44 1
1872.....	23 6	25 1	28 3	25 7	37 6	49 0	53 0	53 0	50 5	38 7	33.3	29 9	37 3
1873.....	32 9	24 4	33 9	38 8	46 3	55 8	65 8	52 5	54 9	41 1	36 6	24 2	42 3
1874.....	21 7	22 6	26 3	36 3	46 6	53 3	67 0	59 3	58 0	45 8	35 7	28.7	41 8
1875.....	26 9	27 7	32 0	45 0	51 7	56 4	66 7	68 0	56 3	50.4	38 0	32.2	45 5
1876.....	22 8	28 1	30 7	38 6	45 9	60 0	62 6	60 3	54 3	45 5	37 6	31 6	43.2
1877.....	27 6	33 9	42 0	40 2	45 6	57 4	66 6	62 5	58 9	41 5	39 7	30.6	45 5
1878.....	29 5	30 4	36 6	42 0	57 7	63 3	65 7	67 8	58 1	47 1	40 8	29 8	47 4
1879.....	25 1	34 8	36 3	40 5	46 1	61 7	66 8	66 5	60.9	43 5	33 1	22 9	44 8
1880.....	21 8	21 8	25 9	35 3	46 0	58 9	68 2	63 4	57 6	48 5	30 3	33 1	42 6
1881.....	29 4	34 6	35 9	50 0	54 6	60 0	66 1	61 1	55 6	42 6	29 0	28 6	45 6
1882.....	22 0	22 7	28 1	34 4	51 1	58 0	69 9	66 6	56 8	44 8	35 8	32 1	43 4
1883.....	22 9	21 4	36 7	39 7	47 7	61 9	68 1	61 8	57 8	43 5	33 9	29 8	43 8
1884.....	25 6	21 8	29 5	39 7	60 8	56 0	63 2	65 6	52 3	44 1	37 3	28 1	42 8
1885.....	27 6	34 3	39 9	42 8	49 8	52 8	62 2	61 5	53 8	46 8	36 7	31 5	45.0
1886.....	25 6	32 7	29 7	38 4	51 5	58 3	64 9	61 8	52 3	39 1	32 0	35 9	43 5
1887.....	29 1	24 0	38 2	38 5	50 0	57 5	62 9	60 0	52 1	46 4	37 8	25 1	43 5
1888.....	20 2	29 6	33 6	46 5	51 6	56 0	67 3	64 9	61 6	50 6	40 0	34 0	46 3
1889.....	23 1	31 5	41 1	50 3	54 5	70 5	69 3	69 2	61 1	46 3	39 4	29.7	48 8
1890.....	21 7	25 1	30 8	38 8	47 2	56 4	71 3	64 9	56 6	47 1	37 0	26 7	43 6
1891.....	25 4	27 8	33 9	40 8	49 6	56 5	66 0	66 4	53 1	45 9	38 4	23 7	44.0
1892.....	26 6	32 1	33 4	37 2	48 2	53 8	60 3	66 0	61 2	43 2	38 3	23 7	43.7
1893.....	28 4	25 1	30 4	34 9	45 4	57 0	61 4	66 2	50 6	47 3	37 2	28 5	42 7
1894.....	23 2	23 7	31 0	41 7	47 4	48 2	65 5	65.6	58 3	46 7	38 8	25 7	43.0
1895.....	22 7	26 3	30 5	38 4	46 3	55 7	61 8	62 9	51 6	47 6	36 2	26 6	42 2
1896.....	27 4	30 8	34 3	34 2	43 7	60 8	68 6	63 6	54 6	47 4	35 8	31 0	41.6
1897.....	25 9	25 5	25 7	40 3	56 3	58 5	63 6	63 2	53 8	41.6	39 4	26 0	43 3
1898.....	16 4	32 6	33 0	45 2	46 2	59 0	71 4	73 2	60 4	43 2	33.0	21 5	44 6
1899.....	29 1	39 0	35 1	40 8	44 0	56 1	62 8	63 5	49 5	48 4	43 4	26 4	44 8
1900.....	30 6	31 5	33 4	46 0	48 6	55 2	60 4	58 2	53 3	43 0	37 4	32 1	44 2
Means (30 years) ..	25 3	28 3	32 9	40 0	48 4	57 4	65 4	63 4	55 9	45 1	36 5	28 7	43 9

## MONTHLY AND ANNUAL PRECIPITATION (INCHES AND HUNDREDTHS).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June	July.	Aug.	Sept. *	Oct.	Nov.	Dec.	Annual.
1870.....	5.90	6.18	4.85	0.12	2.40	0.80	1.30	0.05	0.00	0.00	0.51	1.67	23.28
1871.....	4.80	4.23	3.15	2.00	0.28	0.42	0.00	0.00	0.20	0.02	5.35	16.23	36.71
1872.....	3.42	10.49	3.63	4.11	0.60	0.30	0.00	0.00	0.00	0.40	0.60	3.74	27.39
1873.....	3.78	9.55	1.69	1.36	0.55	0.00	T.	0.00	0.00	0.11	0.42	8.70	26.16
1874.....	9.54	6.15	9.35	2.61	0.68	0.11	0.56	0.07	0.04	2.44	3.54	0.60	35.69
1875.....	8.50	0.20	1.20	0.90	0.00	1.81	0.40	0.03	T.	0.62	8.94	4.90	27.50
1876.....	9.85	5.60	6.95	1.83	0.84	0.01	0.05	0.03	0.03	3.64	0.07	0.05	28.85
1877.....	9.45	0.39	1.84	1.03	1.12	0.36	0.00	0.00	0.04	0.00	1.66	0.24	16.13
1878.....	5.97	11.30	2.07	0.80	1.17	0.10	0.00	0.28	0.23	0.75	2.14	0.50	25.81
1879.....	7.70	2.68	5.25	1.55	0.45	0.00	0.00	0.00	0.07	1.40	3.78	4.98	27.86
1880.....	2.95	4.65	4.65	12.74	2.50	0.00	0.16	0.00	0.00	0.00	0.45	9.51	37.61
1881.....	5.71	2.13	1.86	0.49	0.40	1.26	0.18	0.00	0.25	2.50	2.70	3.80	21.28
1882.....	6.40	4.95	12.05	1.89	0.85	0.98	0.60	0.00	0.00	0.85	1.04	0.80	30.41
1883.....	1.55	3.05	1.65	2.19	1.13	0.00	0.53	0.00	0.12	2.46	2.50	1.62	16.80
1884.....	6.65	11.20	5.38	3.90	0.14	1.02	0.00	0.10	0.78	1.50	0.00	18.14	43.81
1885.....	1.80	0.54	0.56	2.04	0.08	0.00	0.00	0.25	0.47	0.00	6.95	2.22	14.91
1886.....	7.08	0.50	2.90	1.78	0.60	0.56	0.89	0.00	T.	0.85	1.10	2.29	18.55
1887.....	3.43	12.25	0.36	2.00	2.04	0.37	0.40	T.	0.00	0.00	0.30	4.80	25.95
1888.....	2.85	0.00	0.00	T.	0.70	0.80	0.72	0.20	0.25	0.00	0.10	1.58	6.70
1889.....	0.80	1.40	2.51	1.01	4.51	0.00	0.00	0.00	0.00	3.13	3.29	14.39	31.04
1890.....	16.20	8.90	7.29	0.20	1.44	0.00	0.00	0.22	0.80	0.45	0.00	3.70	39.20
1891.....	1.22	8.36	3.92	2.17	2.90	0.46	0.00	0.00	0.98	0.05	0.45	6.34	26.85
1892.....	2.65	2.80	3.00	2.96	4.20	0.95	0.00	0.00	0.29	0.37	5.73	8.15	31.10
1893.....	5.44	8.02	5.18	3.73	1.79	0.00	0.00	0.00	1.22	0.35	3.98	2.82	32.51
1894.....	8.06	10.95	2.05	2.15	1.05	T.	0.00	0.00	0.13	1.12	0.60	13.95	40.66
1895.....	11.73	1.92	1.72	0.50	2.40	0.00	0.00	0.00	1.32	0.34	0.50	2.96	23.39
1896.....	7.07	0.40	4.67	9.36	0.54	0.00	0.15	0.34	0.32	0.40	3.86	2.50	29.61
1897.....	2.35	7.97	9.50	0.30	T.	0.18	0.00	0.00	T.	0.55	3.20	3.15	27.20
1898.....	1.05	3.65	2.05	0.25	0.30	0.00	0.00	0.00	0.40	0.06	2.95	1.50	12.21
1899.....	7.80	2.70	9.50	1.10	0.75	0.00	0.00	0.92	0.00	6.49	2.80	1.80	33.86
1900.....	2.63	0.80	4.20	1.90	0.80	1.01	0.00	0.00	0.00	1.02	2.50	2.70	17.56
Average (31 years) .....	5.61	4.98	4.04	2.22	1.20	0.37	0.19	0.08	0.26	1.03	2.32	4.30	26.98

## CLIMATE OF VISALIA.

[From records of Mr. L. V. Nanscawen.]

These records were kept by Mr. L. V. Nanscawen, and cover the period from January 1, 1888, to July 31, 1898.

## TEMPERATURE.

Year.	Number of days with maximum temperature above 90°.					Number of days with minimum temperature below 35°.				Number of days with minimum temperature below 40°.			
	May.	June.	July.	Aug.	Sept.	Nov.	Dec.	Jan.	Feb.	Oct.	Mar.	Apr.	
1888.....		7	20	31	31	18	2	11	13	9	0	31	12
1889.....		10	25	31	24	18	8	12	17	6	7	9	8
1890.....		6	11	28	26	9	0	13	17	5	3	23	10
1891.....		1	8	26	27	9	1	10	14	10	0	21	17
1892.....		8	5	23	22	4	0	9	5	1	4	21	16
1893.....		0	9	26	26	3	6	9	21	4	4	21	24
1894.....		2	4	30	26	9	5	5	18	4	2	22	5
1895.....		4	18	18	23	3	7	24	4	3	0	22	11
1896.....		4	18	24	23	8	6	12	11	3	0	8	6
1897.....		7	11	21	24	11	15	26	11	10	8	18	2
1898.....		5	15	31					29	10		27	7

CLIMATOLOGY OF CALIFORNIA.

WEATHER.

Month	Average number days—				Month	Average number days—			
	Clear	Partly cloudy	Cloudy	Rainy		Clear.	Partly cloudy.	Cloudy	Rainy
January ...	11	5	15	6	August	20	6	5	0
February ..	12	2	14	5	September	20	5	5	1
March ...	12	4	15	6	October .	19	4	8	2
April ..	16	3	11	3	November	15	5	10	2
May ...	19	5	7	2	December ..	8	5	18	8
June .	22	3	5	0	Annual ....	196	52	117	35
July ..	22	5	4	0					

GREATEST PRECIPITATION IN 24 HOURS FOR EACH MONTH.

[Inches and hundredths]

Year.	Jan	Feb	Mar	Apr	May	June	July	Aug.	Sept	Oct.	Nov.	Dec.	Greatest annual.
1888 . . . . .	1.86	0 15	0 84	0 14	0.00	0.00	0.00	0.00	0.35	0.00	1.46	0 62	1 86
1889... ..	0 42	0 24	0.89	0 27	0 70	0.00	0.00	0.00	T	2.11	0.22	0 70	2 11
1890. . . . .	1 64	0 41	0.48	0 17	0.29	0.00	0.00	T	0.40	0.00	0.47	0.80	1.64
1891. . . . .	0.46	0.60	0.21	1.05	0.07	0.04	0.00	0.00	1.10	0.00	0.34	1.54	1.54
1892. . . . .	0.20	0 57	0.76	0.35	0.50	0 18	0.00	0.00	T.	0.37	0.35	0 92	0 92
1893. . . . .	0 47	1.26	1.47	0.26	0.00	0 00	T	0.00	0 00	0.00	0.13	0.64	1 47
1894. . . . .	0.59	0 22	0 91	0.21	0.34	1 42	0.00	0.00	0.45	0 28	0.10	1.33	1.42
1895. . . . .	1.32	1.22	0 41	0 24	0.48	0 00	T.	T.	0.04	0.45	0.64	0.40	1 32
1896... ..	1 12	0 04	0.46	0.50	0.11	0.00	0.22	0.10	0.00	0.88	0.92	0.35	1.12
1897 . . . . .	1.00	0 54	0.67	0.39	T.	T.	T.	0.00	0.40	0.35	0.40	0.45	1.00
1898. . . . .	0.22	0.39	0.48	0 06	0.71	0.00	T.	.....	.....	.....	.....	.....	.....
Greatest .....	1.86	1.26	1.47	1.05	0.71	1.42	0.22	0 10	1.10	2.11	1 46	1.54	.....
Date .....	8, 1888	9, 1893	20, 1893	16, 1891	15, 1893	5, 1894	22, 1896	29, 1896	15, 1891	28, 1899	16, 1888	29, 1891	.....
Year .....													

MEAN MONTHLY AND ANNUAL TEMPERATURE (DEGREES FAHRENHEIT).

Year.	Jan	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1888. . . . .	37.0	45.6	46.7	62.1	68.8	77.8	85.4	84.7	79.5	65.0	52.4	45.4	62.1
1889... ..	42.9	50.0	57.5	62.8	68.9	81.2	83.9	81.4	76.4	57.9	49.5	45.6	63.2
1890. . . . .	39.9	47 0	51.5	57 6	67.8	72.9	80.2	78.2	71.7	62.8	53.8	48.4	60.5
1891... ..	44 4	46.8	51.1	56 1	65 0	71.8	83.0	81.4	69.4	64.5	52.9	48.8	60.9
1892. . . . .	46.6	50 4	51.4	54.5	64.4	67 2	79.0	78.4	68 9	61.8	54 1	45.1	60.2
1893... ..	42.0	47.2	49.4	51 1	64.7	72.8	79.3	78.9	64.9	57.8	50.0	47.0	58 8
1894. . . . .	43 0	46.9	51.7	60.6	67 0	67.3	82.3	79.6	71.0	61.0	54.1	46 5	61.0
1895. . . . .	40.2	51.3	50.3	58.7	67 2	75 5	77 1	76.4	68 2	64.8	48.4	40 9	60.4
1896. . . . .	49 7	53.1	58 0	54.0	64.4	77.4	83.8	78 0	71.7	67.2	48.7	47.7	63.6
1897. . . . .	45 0	48 6	48.9	62.0	69 2	71.3	78.6	78 4	70.9	59.2	50.5	41 0	60.3
1898. . . . .	39 4	51.1	50.6	62 5	63.3	73.4	81 4	.....	.....	.....	.....	.....	.....
Mean . . . . .	43.3	48.9	51.6	58.4	66.4	73 5	81.2	79.5	71.9	62.2	51.5	44.6	61.1

## SUMMARY OF MONTHLY MEANS AND EXTREMES OF TEMPERATURE.

Month.	Highest monthly mean.		Lowest monthly mean.		Absolute maximum.		Absolute minimum.		Greatest daily range.	Mean daily range.	Mean of 3 consecutive warmest days.	Mean of 3 consecutive coldest days.
	Date.	Temperature.	Date.	Temperature.	Date.	Temperature.	Date.	Temperature.				
January.....	1896	49.7	1888	37.0	15, 1893	67	16, 1888 26, 1898	17	40	18.4	57.8	23.2
February.....	1896	53.1	1888	45.6	24, 1896	78	22, 1897	23	40	22.2	60.3	38.7
March.....	1896	58.0	1888	46.7	25, 1896	83	22, 1898	22	44	26.1	70.3	39.7
April.....	1889	62.8	1893	51.1	25, 1898	104	(a)	30	55	29.5	80.3	45.5
May.....	1897	69.2	1898	63.3	22, 1892	101	{ 3-5-6, 1892 }	35	47	30.1	83.0	50.7
June.....	1889	81.2	1892	67.2	{ 30, 1891 25, 1898 }	107	9, 1892	38	52	31.1	90.0	52.3
July.....	1888	85.4	1895	77.1	27, 1898	113	3, 1895	50	49	31.1	90.3	67.2
August.....	1888	84.7	1895	76.4	28, 1888	107	{ 26-29- 30, 1895 }	51	39	30.7	91.3	66.3
September.....	1888	79.5	1893	64.9	1, 1888	106	30, 1894	37	42	30.1	91.0	52.7
October.....	1896	67.2	1893	57.8	{ 4, 1889 2-4, 1896 }	92	30, 1889	34	39	27.7	74.0	51.0
November.....	1894	54.4	1895	48.4	19, 1897	80	(b)	23	46	26.5	60.7	34.3
December.....	1896	47.7	1897	41.0	10, 1896	70	{ 5-20, 1897 }	19	39	19.7	53.0	34.5
Annual.....	1888	85.4	1888	37.0	{ July 27, 1898 }	113	{ Jan. 16, 1888 Jan. 26, 1898 }	17	55	26.5	.....	.....

a Several years and dates.

b Several dates in 1896 and 1897.

## MONTHLY, ANNUAL, AND SEASONAL PRECIPITATION (INCHES AND HUNDREDTHS).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.	Season of.	Seasonal.
1888.....	3.06	0.16	1.61	0.14	0.00	0.00	0.00	0.00	0.35	0.00	2.39	1.70	9.41	.....	.....
1889.....	0.71	0.36	3.46	0.49	1.22	0.00	0.00	0.00	T.	4.08	0.66	3.21	14.19	1888-89	10.68
1890.....	3.34	1.12	1.10	0.25	0.46	0.00	0.00	T.	0.73	0.00	0.51	2.86	9.87	1889-90	14.22
1891.....	0.57	2.85	0.66	1.36	0.07	0.04	0.00	0.00	1.10	0.00	0.34	3.46	10.45	1890-91	9.15
1892.....	0.25	1.79	3.01	0.54	1.64	0.18	0.00	0.00	T.	0.39	0.61	2.17	10.58	1891-92	12.31
1893.....	1.28	1.78	3.61	0.43	0.00	0.00	T.	0.00	0.00	0.00	0.13	1.38	8.61	1892-93	10.27
1894.....	1.90	1.03	1.25	0.21	0.48	1.42	0.00	0.00	0.50	0.35	0.10	3.75	10.99	1893-94	7.80
1895.....	4.30	1.68	1.61	0.65	0.47	0.00	T.	T.	0.08	0.45	0.64	0.61	10.49	1894-95	13.41
1896.....	3.02	0.04	0.99	1.33	0.23	0.00	0.40	0.10	0.00	0.92	1.08	0.85	8.96	1895-96	7.39
1897.....	3.51	2.11	1.93	0.39	T.	T.	T.	0.00	0.40	0.64	0.48	0.96	10.42	1896-97	11.29
1898.....	0.54	0.96	0.74	0.08	0.73	0.00	.....	.....	.....	.....	.....	.....	.....	1897-98	5.53
Mean.....	2.04	1.26	1.82	0.53	0.48	0.15	0.04	0.01	0.32	0.68	0.69	2.04	10.40	.....	10.20

## EXTREMES OF PRECIPITATION.

Month.	Greatest monthly precipitation.		Least monthly precipitation.		Month.	Greatest monthly precipitation.		Least monthly precipitation.	
	Date.	Amount.	Date.	Amount.		Date.	Amount.	Date.	Amount.
January.....	1895	4.30	1892	0.25	July.....	1896	0.40	(a)	0.00
February.....	1891	2.85	1896	0.04	August.....	1896	0.10	(a)	0.00
March.....	1893	3.61	1891	0.66	September.....	1891	1.10	1893 1896	0.00
April.....	1891	1.36	1898	0.08	October.....	1889	4.08	(a)	0.00
May.....	1892	1.64	{ 1888 1893 }	0.00	November.....	1888	2.39	1894	0.10
June.....	1894	1.42	(a)	0.00	December.....	1894	3.75	1895	0.61

a In many years.

CLIMATOLOGY OF CALIFORNIA.

TOTAL NUMBER OF DAYS WITH PRECIPITATION

Month	Less than 0 01 inch	0 01 to 0 10 inch	0 11 to 0 25 inch	0 26 to 0 50 inch	0 51 to 1 inch	Over 1 inch	Month	Less than 0 01 inch	0 01 to 0 10 inch	0 11 to 0 25 inch	0 26 to 0 50 inch	0 51 to 1 inch	Over 1 inch
January .....	8	14	19	16	9	3	July . . . . .	4	1	2	0	0	0
February .....	4	14	20	13	4	1	August . . . . .	2	1	0	0	0	0
March .....	7	19	16	20	11	0	September . . . . .	10	4	0	5	0	1
April .....	7	10	12	6	0	0	October . . . . .	8	4	3	5	3	1
May .....	6	8	4	6	3	0	November . . . . .	1	7	6	7	2	1
June .....	2	1	1	0	0	1	December . . . . .	8	23	23	19	16	1

NORMAL MONTHLY AND ANNUAL TEMPERATURE (DEGREES FAHRENHEIT)

Stations	Elevation	Length of record	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	An-nual.
	<i>Feet</i>	<i>Years</i>													
Anaheim .....	134	23	54 8	56 2	59 2	62 8	66 7	69 8	72 4	73 3	71 9	66 6	61 1	56 9	64 8
Angiola .....	208	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Antioch .....	46	22	46 5	50 8	54 4	59 7	66 1	72 0	75 8	74 5	71 1	63 4	53 8	48 3	61 4
Aptos .....	102	16	48 5	49 5	52 8	54 9	58 8	62 5	62 3	61 4	60 9	57 8	53 0	49 7	56 0
Azusa .....	616	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bakersfield .....	404	12	48 1	52 4	57 9	64 7	72 9	81 9	88 6	84 7	75 8	66 0	55 9	48 2	66 4
Berkeley .....	320	14	47 6	49 7	51 7	54 0	57 3	60 9	61 0	60 9	61 3	58 9	54 6	48 9	55 6
Biggs .....	98	2	...	...	...	...	...	...	...	...	...	...	...	...	...
Bishop .....	4,450	17	38 2	44 9	51 0	61 1	69 3	77 7	84 6	81 0	71 3	60 6	49 4	40 9	60 3
Blue Canyon .....	4,695	2	...	...	...	...	...	...	...	...	...	...	...	...	...
Bodie .....	8,248	6	20 2	23 0	25 3	33 8	41 8	51 9	57 6	54 4	47 0	37 7	30 1	20 8	37 1
Bowman's Dam .....	5,500	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Byron .....	83	21	46 4	50 4	56 4	61 5	67 1	75 5	80 9	77 5	71 8	63 3	58 9	47 8	62 8
Cabazon .....	1,779	5	51 0	54 7	56 1	62 2	65 0	75 6	82 9	79 1	75 5	67 5	62 6	54 0	65 7
Caliente .....	1,290	25	49 4	51 8	56 0	60 9	70 0	78 9	84 8	83 1	75 0	64 8	55 2	49 7	65 0
Calistoga .....	363	29	48 1	50 1	53 5	57 8	61 5	69 6	72 6	70 3	66 7	60 0	58 4	49 2	59 6
Campbell .....	194	4	...	...	...	...	...	...	...	...	...	...	...	...	...
Cedarville .....	4,675	7	31 5	34 9	37 3	42 3	51 9	60 5	69 2	67 9	58 6	48 9	38 9	30 2	47 7
Chino .....	714	9	50 4	53 5	55 6	60 8	64 7	71 6	77 1	75 2	71 2	63 8	56 8	52 2	62 8
Claremont .....	1,200	9	49 7	51 6	53 0	57 1	60 7	66 7	71 6	70 6	69 2	62 4	57 3	51 6	60 1
Cloverdale .....	315	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Colfax .....	2,421	30	44 4	45 9	49 1	54 3	61 2	71 2	75 3	76 5	69 5	59 9	51 7	46 6	59 0
Colton .....	965	24	50 6	53 2	57 1	61 4	67 5	73 2	78 5	78 9	73 8	64 8	57 5	53 0	64 0
Corning .....	277	15	45 2	48 8	52 6	60 3	68 2	77 3	83 4	81 1	73 9	64 8	55 1	47 3	63 2
Craftonville .....	1,759	9	51 4	52 1	53 8	61 6	66 7	74 0	79 1	78 3	73 4	64 1	57 9	51 1	63 6
Crescent City .....	50	7	47 2	47 6	47 1	49 0	51 6	54 9	56 5	57 4	56 0	53 0	50 1	47 8	51 5
Cuyamaca .....	4,543	2	...	...	...	...	...	...	...	...	...	...	...	...	...
Davisville .....	51	29	47 6	51 6	56 2	60 8	67 9	74 8	77 9	74 1	72 0	64 9	55 7	48 8	62 9
Delano .....	319	25	47 1	51 7	56 8	62 6	70 8	79 7	85 7	85 5	78 6	68 4	55 8	48 9	65 8
Delta .....	1,138	16	41 8	45 5	50 8	57 4	64 8	72 2	78 9	76 3	69 3	59 3	51 1	41 2	59 3
Drytown .....	790	9	45 3	49 3	51 2	56 1	61 0	68 5	76 3	74 6	68 0	59 8	52 8	45 4	59 4
Dunnigan .....	65	24	46 3	49 2	55 0	62 4	70 3	77 9	81 8	79 7	74 6	69 3	55 0	47 3	63 8
Dunsmuir .....	2,285	12	38 9	40 8	44 4	49 5	57 5	63 4	69 5	66 9	60 5	52 4	44 9	39 7	52 0
Durham .....	180	6	45 2	50 2	51 1	57 2	63 2	73 4	79 4	75 7	68 1	60 2	51 0	43 7	59 9
Edmanton .....	4,750	8	34 2	35 2	36 5	42 8	49 0	57 5	64 5	62 8	56 0	49 0	41 0	34 4	46 9
El Cajon .....	463	2	...	...	...	...	...	...	...	...	...	...	...	...	...
Eldorado .....	1,609	12	45 8	48 6	52 3	57 8	64 5	72 7	79 3	76 6	69 6	62 0	54 2	47 5	60 9
Elmdale .....	126	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Elmira .....	75	15	47 9	51 7	56 1	62 5	68 1	74 1	77 1	75 8	72 1	63 8	56 0	49 0	62 9
Elsinore .....	1,234	6	50 3	53 0	56 3	61 7	66 0	71 5	78 4	77 1	74 2	65 6	59 2	52 6	63 8
Escondido .....	650	7	49 6	52 0	54 3	58 3	62 6	67 9	72 5	72 1	69 0	61 5	55 1	49 5	60 3
Fallbrook .....	700	25	50 1	51 5	53 8	57 3	61 1	65 8	69 7	70 3	67 5	60 9	55 8	52 9	59 7
Farmington .....	111	22	45 7	50 1	53 9	59 1	66 1	73 7	78 2	76 2	72 0	63 7	53 7	47 0	61 6
Fernando .....	1,066	23	50 5	53 0	56 3	61 1	64 7	70 1	74 7	75 4	72 0	65 0	59 2	54 0	63 0
Folsom .....	182	12	47 2	51 1	55 9	61 7	67 7	75 8	81 9	79 4	72 8	64 0	55 6	47 6	63 3
Fort Ross .....	100	8	48 3	49 0	50 0	51 8	54 4	56 8	57 5	59 5	57 2	55 1	52 3	49 6	53 4
Fruto .....	624	12	47 1	49 7	52 9	58 9	67 9	77 0	82 5	80 6	72 3	64 2	56 1	47 8	63 1
Galt .....	49	23	47 3	50 3	55 2	61 2	67 1	74 6	79 0	77 4	72 0	63 0	54 0	43 7	62 5
Georgetown .....	2,750	28	46 4	48 4	51 9	55 4	62 4	70 9	78 8	77 9	73 0	63 6	55 4	48 5	61 0
Greenville .....	3,600	7	33 2	36 7	38 5	46 5	52 7	59 5	65 4	63 5	56 7	49 7	40 6	33 6	48 0

## NORMAL MONTHLY AND ANNUAL TEMPERATURE (DEGREES FAHRENHEIT)—Continued.

Stations.	Elevation.	Length of record.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
	Feet.	Years.													
Healdsburg .....	100	8	44.6	48.1	50.3	54.9	58.7	63.9	66.8	64.8	62.8	59.4	54.0	46.0	56.2
Hornbrook .....	2,154	13	35.0	39.7	45.5	51.8	61.3	68.0	75.3	75.3	65.0	52.1	42.7	37.5	54.1
Huron .....	367	9	47.2	51.4	55.3	61.7	68.3	78.4	86.2	83.0	74.3	65.2	56.2	47.7	64.5
Independence .....	3,907	5	40.7	45.8	50.0	57.2	63.0	72.6	79.1	76.0	69.0	59.4	48.8	42.0	58.7
Indio .....	— 20	23	52.9	58.7	65.3	72.5	80.1	88.3	94.5	93.0	86.5	75.4	62.6	56.6	73.7
Ione .....	287	23	46.6	49.2	53.9	58.7	65.0	73.6	78.6	78.1	71.6	62.5	53.4	48.2	61.6
Iowa Hill .....	2,825	20	43.4	45.3	47.1	53.7	59.8	67.5	75.2	74.5	67.8	59.5	51.4	45.8	57.4
Jackson (near) .....	1,975	9	41.9	44.8	46.8	53.3	57.3	65.4	72.9	70.2	64.7	57.1	49.6	43.0	55.6
Keeler .....	3,620	16	41.8	46.5	52.9	61.7	69.4	77.9	84.7	83.4	73.6	64.3	52.5	43.8	62.7
Kennedy Gold Mine .....	1,500	9	43.5	46.5	48.4	53.7	59.4	67.8	75.2	73.3	66.9	59.1	51.2	43.9	57.4
King City .....	333	14	48.4	48.8	53.5	56.2	59.6	63.7	67.0	66.4	66.0	59.3	53.8	49.0	57.6
Knights Landing .....	45	23	46.8	50.3	54.8	59.2	66.6	72.3	77.4	76.6	70.9	62.7	54.1	48.4	61.7
Kono Tayee .....	1,825	8	44.6	47.5	49.5	55.7	60.8	69.1	76.2	74.7	67.8	60.3	52.0	45.5	58.6
Laporte .....	5,000	7	33.4	35.4	34.5	41.3	47.7	56.8	62.5	59.8	53.3	46.6	39.6	34.1	45.4
Lemon Cove .....	600	6	48.2	53.6	56.1	62.2	69.0	78.2	83.3	79.9	74.4	67.2	55.6	46.4	64.5
Lick Observatory .....	4,209	12	39.7	40.5	41.0	46.0	51.6	60.5	69.4	69.1	61.9	54.0	49.4	42.0	52.1
Lodi .....	35	19	46.2	50.1	54.7	58.3	63.4	69.1	73.7	73.0	69.7	62.3	53.6	47.3	60.1
Los Banos .....	121	14	46.5	50.3	55.8	63.4	68.4	76.9	81.5	79.3	74.0	64.2	54.4	47.1	63.5
Los Gatos .....	600	14	47.6	49.6	51.8	56.0	60.3	65.3	67.7	67.2	65.6	60.7	54.3	48.8	57.9
Manzana .....	2,850	7	42.4	44.6	47.5	54.9	61.2	72.3	80.1	78.4	71.2	60.1	51.1	43.4	58.9
Martinez .....	10	23	46.4	49.2	52.9	57.0	61.2	66.7	68.4	66.5	64.9	59.7	53.0	47.8	57.8
Marysville .....	67	30	48.4	51.3	57.4	62.0	68.8	76.2	80.0	78.9	74.0	65.3	56.4	49.9	64.0
Mendota .....	177	7	46.7	49.9	53.5	62.2	68.4	77.0	83.1	78.6	71.8	64.1	54.3	48.2	63.1
Merced .....	173	27	47.0	51.0	55.0	60.0	67.3	75.3	81.7	79.3	73.7	64.8	55.4	48.3	63.2
Modesto .....	90	29	46.6	50.1	55.9	62.2	69.4	76.6	81.5	79.7	74.7	65.3	55.8	48.1	63.8
Mokelumne Hill .....	1,550	8	41.6	45.1	46.8	53.0	59.5	69.3	76.9	73.1	65.8	58.2	50.5	43.4	57.0
Mojave .....	2,751	24	45.3	48.8	53.5	59.7	68.0	77.5	85.7	84.2	73.9	65.6	54.8	46.8	64.0
Monterey .....	15	36	50.2	51.2	53.9	55.8	58.3	60.8	61.0	61.9	61.5	58.2	54.3	51.7	56.6
Monterio .....	4,500	2													
Mount Tamalpais .....	2,375	2													
Napa (S. H.) .....	20	23	45.4	49.4	51.8	55.9	59.9	64.6	65.8	65.0	63.6	58.7	51.8	46.5	56.5
Needles .....	491	9	52.4	57.8	64.8	72.2	80.2	87.8	94.4	92.3	84.7	72.2	60.1	52.8	72.6
Nevada City .....	2,580	9	40.8	42.5	44.2	49.8	55.6	62.9	68.6	67.0	60.6	54.0	47.0	41.9	52.9
Newcastle .....	956	8	46.4	47.7	51.0	58.2	64.7	74.0	80.2	77.7	72.6	63.5	54.9	47.4	61.5
Newhall .....	1,200	24	47.9	50.2	54.1	58.9	64.1	70.7	76.6	77.3	71.5	62.1	54.8	49.5	61.5
Newman .....	92	12	48.0	51.8	56.1	63.1	70.7	78.9	84.6	81.8	74.2	64.5	57.1	48.4	65.1
Niles (near) .....	87	14	51.7	54.4	56.7	59.9	62.9	67.2	68.9	69.0	68.3	62.3	56.8	52.4	60.9
North Hill Vineyard .....	660	11	47.0	50.8	54.0	58.6	64.6	72.6	78.6	76.5	71.5	64.2	56.3	46.9	61.8
Oakdale .....	156	7	45.7	48.7	52.7	59.3	64.9	73.9	79.7	76.3	71.4	62.5	52.9	44.9	61.1
Ogilby .....	354	11	56.4	60.7	68.3	76.3	84.0	93.8	99.4	98.1	91.8	77.3	67.8	56.0	77.5
Oleta .....	1,510	9	42.8	44.9	47.3	52.5	58.5	66.6	73.0	70.6	63.0	55.6	48.6	42.8	55.6
Orland .....	254	18	47.6	51.2	55.7	62.4	70.4	78.7	86.4	84.2	76.7	68.4	56.4	47.9	65.4
Oroville .....	183	17	48.1	51.5	55.8	60.7	67.2	75.2	81.3	79.3	73.8	66.6	57.1	48.8	63.8
Palermo .....	185	10	45.5	49.7	52.8	58.5	65.6	74.3	78.9	77.1	70.0	61.9	52.4	45.2	61.0
Palm Springs .....	584	12	55.3	58.7	65.1	74.6	81.1	90.6	97.7	93.2	85.2	74.5	65.1	55.1	74.7
Paso Robles (near) .....	723	14	44.6	47.8	51.6	57.9	61.9	68.4	72.5	71.1	66.9	59.8	51.6	45.6	58.3
Peachland .....	220	5	48.0	50.5	51.8	56.2	59.6	65.0	66.0	63.3	63.2	58.6	52.4	47.3	56.8
Pine Crest .....	1,000														
Placerville .....	1,820	12	41.1	43.6	46.3	51.1	58.5	66.8	72.7	69.8	62.8	55.5	48.1	42.0	54.8
Point Lobos .....	250	8	48.4	50.1	50.0	52.0	53.9	55.3	56.0	57.0	57.6	56.3	53.8	49.4	53.3
Point Reyes .....	490	9	49.4	49.2	49.6	50.2	51.6	52.8	53.7	54.5	56.1	54.7	53.0	50.6	52.1
Pollasky .....	1,200														
Pomona (near) .....	857	7	51.5	53.7	55.8	61.1	65.1	70.2	74.6	74.7	72.0	64.8	59.1	53.3	63.0
Porterville .....	461	12	48.1	51.7	56.8	64.0	73.2	82.5	88.1	84.8	76.3	64.6	54.9	48.5	66.0
Poway .....	460	17	48.0	49.5	52.4	55.8	60.6	65.1	68.9	69.6	65.9	59.4	53.5	51.1	58.3
Quincy .....	3,350	6	34.6	38.0	41.0	47.6	54.3	62.4	65.9	63.6	57.0	49.6	41.1	34.5	49.1
Redding .....	557	26	45.2	49.3	53.8	60.2	67.4	75.6	82.3	81.0	74.0	64.5	54.1	47.0	62.8
Redlands .....	1,335	8	50.8	52.2	54.7	61.1	65.8	73.8	78.3	77.5	72.1	65.0	53.9	53.2	63.5
Reedley .....	347														
Repress .....	305	8	45.7	48.7	51.6	57.2	63.0	71.4	76.8	74.0	68.8	61.3	53.3	45.8	59.8
Rio Vista .....	33	8	45.6	50.8	54.3	58.0	63.6	70.4	74.5	72.6	69.3	62.4	53.7	45.4	60.0
Riverside .....	1,025	19	51.1	52.7	55.9	60.4	65.2	70.6	76.3	76.4	72.1	64.2	58.2	53.4	62.9
Rocklin .....	249	30	46.6	50.1	54.9	60.4	67.8	75.0	80.0	78.2	72.7	63.6	53.9	47.9	62.5
Rosewood .....	865	7	42.2	45.7	49.6	56.5	63.7	73.3	80.4	76.8	68.3	58.8	48.8	42.7	58.9

## NORMAL MONTHLY AND ANNUAL TEMPERATURE (DEGREES FAHRENHEIT)—Continued

Stations	Elevation	Length of record	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
	<i>Feet</i>	<i>Years</i>													
Salton . . . . .	-263	12	55 7	58 8	66 0	76 5	83 1	93 8	98 9	97 2	91 0	79 1	66 8	56 1	76 9
San Ardo . . . .	236	14	46 4	49 4	53 0	58 4	61 9	68 2	69 4	70 0	66 2	61 1	53 9	48 0	58 9
Sanger . . . . .	371	12	47 7	52 8	56 8	64 2	72 6	80 8	87 9	84 4	75 2	66 1	56 8	47 6	66 1
San Jacinto . . .	1,500	8	49 2	51 3	53 5	57 3	64 5	70 2	76 2	76 0	70 6	62 2	56 1	50 0	60 2
San Leandro . . .	50	6	53 1	54 7	55 8	58 3	60 6	63 9	64 1	64 6	64 4	61 5	56 8	52 4	59 2
San Luis Obispo .	201	6	52 2	54 6	54 0	56 4	58 0	63 0	65 0	65 0	64 9	61 5	57 6	53 0	58 7
San Miguel . . .	616	14	46 6	49 2	53 5	58 3	63 8	70 3	75 0	72 9	68 6	61 9	53 7	47 6	60 1
San Miguel Island	500	7	53 6	54 9	53 3	55 5	56 3	58 8	60 8	60 8	60 6	60 4	57 4	54 8	57 3
Santa Ana . . . .	137	12	55 5	57 5	60 2	64 2	68 8	72 2	75 0	75 4	73 3	68 4	61 8	57 5	65 8
Santa Barbara . .	130	17	53 2	54 8	55 4	58 4	60 2	63 2	65 1	66 9	65 7	62 6	59 1	55 7	59 9
Santa Cruz . . . .	18	28	51 1	52 7	54 5	57 8	59 8	63 1	63 9	64 5	63 1	59 7	55 5	52 4	58 2
Santa Margarita .	996	12	43 4	46 5	49 7	55 9	60 4	67 2	70 7	69 1	65 9	59 2	50 8	45 0	57 0
Santa Maria . . .	220	13	51 6	52 6	55 2	57 8	59 8	62 9	64 4	64 9	64 0	62 3	57 8	53 7	58 9
Santa Monica . . .	92	13	54 2	54 6	57 8	61 3	64 4	66 9	69 9	70 3	67 8	64 8	60 2	57 0	62 5
Santa Paula . . .	286	12	52 4	54 0	55 8	60 5	63 4	65 6	68 5	68 4	66 3	62 5	59 8	55 6	61 1
Santa Rosa . . . .	181	12	48 0	50 5	52 6	56 4	62 0	66 8	67 2	65 9	64 2	59 6	53 9	48 9	58 0
Selma . . . . .	311	15	45 0	50 8	54 8	62 4	70 5	79 2	85 4	83 1	77 4	64 0	54 6	46 0	64 4
Sisson . . . . .	3,555	12	34 0	36 7	39 7	47 9	55 3	63 4	69 7	67 6	58 2	50 0	41 1	34 5	49 7
Soledad . . . . .	188	27	47 1	50 2	53 6	57 3	62 3	65 5	66 1	65 1	64 9	59 8	53 2	49 3	57 9
Sonoma . . . . .	30	8	49 0	50 0	52 3	54 6	59 2	61 6	65 4	65 6	64 7	60 4	55 4	48 5	57 3
Storey . . . . .	296	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Suisun . . . . .	20	20	47 2	51 5	55 8	59 9	63 8	68 3	71 1	70 7	69 8	63 0	54 8	48 6	60 4
Summerdale . . .	5,270	5	37 1	38 5	37 3	43 3	49 5	61 0	68 5	65 5	60 0	49 3	43 3	39 5	49 4
Summit . . . . .	7,017	28	28 0	28 8	31 4	35 5	42 6	53 2	61 0	60 3	53 7	44 0	35 8	30 5	42 1
Susanville . . . .	4,195	12	31 1	34 4	39 6	47 3	55 9	63 9	71 8	70 7	61 6	50 6	41 8	32 4	50 1
Tehachapi . . . .	3,964	24	38 2	39 3	44 1	50 2	59 2	69 4	76 4	74 5	66 1	56 1	46 5	39 5	54 9
Tehama . . . . .	220	30	47 0	51 0	54 9	60 7	68 9	77 6	84 1	81 3	74 3	64 4	55 1	48 6	64 0
Tejon Rancho . . .	1,450	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tequisquita Rancho	244	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tracy . . . . .	64	21	46 9	50 5	54 8	60 9	69 1	75 9	79 9	77 5	72 0	63 5	54 2	49 6	62 9
Tulare (near) . . .	274	7	47 9	53 4	55 9	62 6	68 2	77 4	83 0	80 1	71 9	63 5	54 9	46 8	63 8
Ukiah . . . . .	620	8	45 1	47 7	50 2	55 0	60 4	67 7	73 4	71 8	65 7	58 4	51 2	44 7	57 6
Upper Lake . . . .	1,350	16	44 8	47 5	50 4	54 6	59 8	66 2	73 1	73 2	67 1	59 8	51 4	45 6	57 8
Upper Mattole . . .	244	14	47 3	48 7	51 0	54 0	58 6	60 7	64 8	65 7	62 8	57 4	51 9	47 5	55 8
Vacaville . . . .	175	13	46 4	51 2	54 3	59 0	65 1	71 9	76 4	75 2	71 2	64 4	55 7	47 6	61 5
Valley Springs . .	678	12	46 2	50 9	54 3	60 2	65 8	74 5	81 0	78 3	72 0	63 2	56 2	47 7	62 6
Ventura . . . . .	50	8	52 8	53 2	53 6	56 0	58 6	62 1	63 5	64 6	61 4	60 1	57 2	54 9	58 2
Vina . . . . .	213	12	46 6	49 9	54 8	61 0	68 0	78 0	84 9	81 5	73 7	65 1	56 1	47 1	63 9
Visalia . . . . .	334	13	43 6	48 7	51 6	58 6	66 3	74 0	81 0	78 8	71 4	62 0	52 0	44 6	61 1
Volcano . . . . .	220	12	55 3	60 6	67 5	78 9	86 8	96 4	101 3	98 7	90 0	77 9	64 9	56 1	77 9
Watsonville . . .	23	5	52 4	52 3	55 1	56 6	58 7	62 4	63 3	62 8	60 3	58 4	56 1	51 3	57 5
Westley . . . . .	90	12	48 4	52 4	57 8	64 2	70 6	77 9	83 1	79 6	73 9	66 2	57 0	49 3	65 0
Wheatland . . . .	84	14	44 6	48 7	52 9	58 4	64 4	71 9	77 2	75 5	70 3	62 5	53 0	45 1	60 4
Whittier . . . . .	239	12	56 5	58 5	61 1	65 4	68 6	73 2	77 4	76 9	74 3	67 7	63 5	57 9	66 7
Williams . . . . .	89	24	46 1	50 0	54 6	61 1	69 3	78 1	83 5	81 0	74 2	64 5	54 0	47 2	63 6
Willows . . . . .	132	22	45 2	48 8	54 6	60 3	68 5	76 9	82 9	81 6	75 6	65 2	54 8	47 2	63 5
Winters . . . . .	136	12	46 9	51 5	56 0	63 1	70 6	79 6	85 5	81 3	74 6	66 9	56 3	48 4	65 1
Wire Bridge . . . .	565	7	45 4	49 2	51 6	59 6	64 9	73 4	79 9	75 9	69 8	61 1	51 9	45 6	60 7
Woodland . . . . .	63	24	46 2	49 9	54 5	59 9	66 9	74 3	78 7	76 2	71 1	63 7	54 8	48 4	62 1
Yreka . . . . .	2,635	10	34 8	37 3	43 5	48 9	56 0	62 5	69 5	69 2	60 4	51 4	42 4	34 8	51 0
Yuba City . . . .	70	9	48 1	52 3	56 2	62 7	68 5	77 4	81 6	78 5	73 2	64 2	55 4	47 8	63 8

## MINIMUM WINTER TEMPERATURES OF THE HIGH SIERRA

(By Prof J N LE CONTE )

The following are the results of two observations on the minimum winter temperature of the summit of Mount Lyell in the Sierra Nevada Mountains of Central California. This point is situated about 18 miles in an air line and 40 miles by trail east of the Yosemite Valley. Its geographical coordinates, as given in the United States Geographical Surveys West of the One Hundredth Meridian, are. North latitude  $37^{\circ} 44' 11''$ , longitude  $119^{\circ} 18' 18 07''$  west. Its elevation, according to the United States Geological Survey, is 13,041 feet above the sea.



Mount Lyell was selected principally on account of its comparative ease of access. The group of mountains of which it is one of the dominating points stands at the southern extremity of what may be called the "northern high Sierra," or that part of the crest of the great range lying between the headwaters of the Mokelumne River and those of the North Fork of the San Joaquin. In passing south along the high Sierra the summit peaks become progressively higher and more rugged, and the area above the timber line more extensive. About the head of the Merced River the northern portion culminates in a magnificent pile of snow capped peaks extending between Mounts Lyell and Ritter, where the southernmost glaciers of the range are to be found. South of Mount Ritter the crest breaks down in a wide belt of rolling, forest-covered mountains for nearly 20 miles, but rises again finally at Red Slate Peak. South of this the range extends as an unbroken wilderness of alpine peaks, rugged beyond description, culminating a second time in Mount Whitney, about 100 miles south of Lyell. This latter is the high Sierra par excellence.

On July 8, 1897, minimum thermometer No. 4315 of the United States Weather Bureau was left upon the summit. It was inclosed in a thin wooden box about 6 inches square and 2 feet long, one side of which was laid exactly in line with the edge of the great southern precipice, here over 1,500 feet high. Large stones were laid upon it, but one side was exposed to the weather, and in no way could it become entirely covered with snow. On June 5, 1898, the mountain was revisited, and the thermometer box was carefully uncovered. The thermometer was in perfect condition, and registered  $-13.6^{\circ}$  F.,  $-25^{\circ}$  C. It was reset and left upon the mountain a second year. Professor Le Conte was unable to make the ascent of the mountain in 1899, but Prof. H. I. Randall, of the civil engineering department of the State University, visited the spot in July and obtained the reading. In this case it was  $-17.6^{\circ}$  F.

It will be remembered that the winter of 1897-98 was an exceptionally dry one, and that of 1898-99 was not severe. It is interesting to compare these temperatures with those taken a few miles farther east and many thousand feet lower:

	1897-98.	1898-99.
Mount Lyell; elevation, 13,040 feet .....	-13.6	-17.6
Bodie; elevation, 8,248 feet .....	-24.0	-30.0
Bishop; elevation, 4,450 feet .....	+10.0	+ 5.0

It would be instructive to obtain the minimum winter temperatures of a number of high peaks distributed along the crest of the range from Lake Tahoe to Mount Whitney.



# GENERAL PRECIPITATION TABLES.

## PRECIPITATION OF CALIFORNIA (INCHES AND HUNDREDTHS).

### ANAHEIM, ORANGE COUNTY.

[Figures appearing in brackets ([ ]) are approximate.]

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1878.....	2.19	4.07	1.49	1.98	0.52	0.00	0.00	0.00	0.00	0.15	T.	0.95	11.80
1879.....	1.96	0.57	0.85	0.37	T.	0.00	0.00	0.00	0.00	0.11	1.72	8.10	8.18
1880.....	1.29	1.82	1.57	2.20	0.00	0.00	0.00	0.00	0.00	0.28	0.44	4.92	12.02
1881.....	0.25	0.28	0.85	0.06	0.00	0.00	0.00	0.00	0.00	0.81	0.34	0.87	2.96
1882.....	0.40	1.90	2.42	0.48	0.40	0.00	0.00	0.00	0.00	0.26	0.78	0.00	6.84
1883.....	1.48	1.98	1.22	0.10	2.78	0.00	0.00	T.	0.00	1.12	0.00	1.40	10.08
1884.....	2.80	10.58	6.70	1.75	0.54	1.28	0.00	0.00	0.00	0.15	0.64	8.72	28.16
1885.....	0.61	0.00	0.00	0.64	0.00	0.00	0.00	0.00	0.00	T.	2.98	1.16	5.84
1886.....	4.68	0.82	2.70	2.51	0.00	0.00	0.00	T.	0.00	0.00	0.38	T.	10.99
1887.....	0.43	5.71	0.00	2.21	T.	0.00	0.00	0.00	T.	0.75	0.92	2.16	12.18
1888.....	6.29	0.92	5.90	T.	0.00	0.00	T.	0.00	0.00	T.	3.75	4.19	21.05
1889.....	0.14	1.28	7.97	0.24	0.57	0.00	0.00	T.	0.76	2.81	0.30	10.95	24.52
1890.....	3.86	1.54	0.78	0.00	T.	0.00	0.00	0.00	0.29	0.00	0.19	3.36	9.52
1891.....	0.24	9.05	0.59	1.81	0.40	0.00	0.00	0.00	0.00	0.00	0.00	1.44	18.58
1892.....	0.77	2.35	1.28	0.15	1.48	0.00	0.00	0.00	0.00	0.19	0.94	1.48	8.59
1893.....	2.98	2.06	6.07	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.30	2.38	14.02
1894.....	0.68	0.35	0.48	0.13	0.10	0.00	T.	T.	0.10	0.00	0.00	5.69	7.58
1895.....	6.92	0.68	2.68	0.05	0.10	0.00	0.00	0.00	0.00	0.00	0.97	0.48	11.88
1896.....	3.25	0.00	3.03	T.	0.00	0.00	0.00	0.00	0.00	1.98	1.40	1.59	11.25
1897.....	3.00	4.35	2.20	0.00	0.00	0.00	0.00	0.00	0.10	1.60	0.00	0.00	11.25
1898.....	1.65	0.10	1.00	0.20	1.00	0.00	0.00	0.00	T.	0.00	0.00	0.20	4.15
1899.....	2.78	0.15	1.61	0.20	0.00	0.51	0.00	0.00	0.07	1.32	0.84	1.45	8.98
1900.....	1.29	0.00	0.78	1.09	1.49	0.09	0.00	0.00	0.00	0.84	4.81	0.00	9.84
Mean (22 years).....	2.15	2.18	2.24	0.71	0.86	0.08	T.	T.	0.06	0.49	0.94	2.82	11.58

### ANTIOCH, CONTRA COSTA COUNTY.

[Elevation, 46 feet.]

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1879.....	1.57	1.69	1.50	0.78	0.88	0.05	0.00	0.00	0.00	0.77	1.38	1.51	10.08
1880.....	0.95	1.07	1.14	3.65	0.38	0.00	0.00	0.00	0.00	0.00	0.25	8.25	15.64
1881.....	1.74	1.54	1.11	1.30	T.	0.00	0.00	0.00	T.	T.	0.95	1.89	8.58
1882.....	0.95	1.20	2.35	0.25	0.00	0.00	0.00	0.00	0.13	1.02	2.49	0.75	9.14
1883.....	1.89	0.48	1.99	0.60	2.55	0.00	0.00	0.00	0.13	0.70	0.55	0.33	9.22
1884.....	3.50	3.64	5.73	2.62	0.00	1.15	0.00	T.	T.	1.25	T.	2.79	20.68
1885.....	1.16	0.12	0.85	0.96	0.00	T.	T.	0.00	0.00	0.00	4.87	2.19	9.65
1886.....	3.60	0.00	0.56	2.08	T.	0.00	0.00	0.00	0.00	0.40	T.	1.02	7.61
1887.....	0.88	3.87	0.49	0.95	0.00	0.00	0.00	0.00	0.41	0.00	0.29	2.30	8.69
1888.....	2.84	1.24	2.05	0.00	0.50	0.00	0.00	0.00	0.70	0.00	1.82	2.88	12.08
1889.....	0.95	0.52	4.81	0.46	1.07	T.	0.00	0.00	0.00	4.51	2.09	6.54	20.95
1890.....	5.16	2.97	2.45	0.81	0.54	0.00	0.00	0.00	0.98	0.04	0.00	1.32	18.72
1891.....	0.41	4.55	2.01	1.14	0.00	0.36	0.00	0.00	0.75	0.75	0.75	4.43	15.15
1892.....	1.06	1.68	2.14	0.46	0.76	0.00	0.00	0.00	0.22	0.45	4.52	4.78	16.02
1893.....	2.93	1.88	2.64	1.02	0.41	0.00	0.00	0.00	0.02	0.06	2.18	1.68	12.77
1894.....	4.29	2.54	0.87	0.28	1.61	0.84	0.00	0.00	1.07	0.68	0.88	8.11	20.12
1895.....	5.57	1.52	0.75	0.00	0.52	0.00	0.00	0.00	0.15	0.15	1.68	0.65	19.94
1896.....	6.15	0.10	1.44	3.18	0.22	0.00	0.00	0.00	0.47	1.55	2.34	1.20	16.76
1897.....	1.98	3.07	3.84	0.12	0.00	0.00	0.00	0.00	0.00	1.09	0.35	0.65	10.80
1898.....	0.79	1.32	0.45	0.15	0.40	0.10	0.00	0.00	0.15	0.84	0.00	0.72	4.92
1899.....	1.61	0.08	5.22	0.15	0.45	0.05	0.00	0.00	0.00	2.66	2.36	1.08	13.56
1900.....	3.04	0.14	0.41	8.57	[0.49]	0.00	0.00	0.00	0.00	0.70	3.43	0.95	9.78
Mean (22 years).....	2.89	1.60	1.97	0.95	0.49	0.12	T.	0.01	0.28	0.80	1.48	2.54	12.57

CLIMATOLOGY OF CALIFORNIA.

PRECIPITATION OF CALIFORNIA (INCHES AND HUNDREDTHS)—Continued

BAKERSFIELD, KERN COUNTY

[Elevation, 394 feet ]

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1889 .....	0 57	0 20	1 88	0 15	0 22	0 00	0 00	0 00	0 00	2 04	0 22	1 75	7 03
1890 .....	1 20	0 16	0 24	0 00	0 06	0 00	0 00	0 03	0 47	0 00	0 00	1 34	3 50
1891 .....	0 20	1 20	0 25	0 27	0 22	0 02	0 00	0 00	0 12	0 00	0 20	1 08	3 96
1892 .....	1 61	0 45	1 25	T	0 41	0 39	0 00	0 00	0 00	0 01	0 55	0 75	5 42
1893 .....	0 61	0 88	2 30	0 32	0 00	0 00	0 00	0 00	0 00	0 00	0 20	0 97	5 28
1894 .....	0 91	0 00	0 50	0 00	0 02	0 17	0 00	0 00	0 30	0 03	0 00	1 43	3 46
1895 .....	2 53	0 40	1 15	0 29	0 31	0 00	0 00	0 00	0 00	1 06	0 54	0 33	6 61
1896 .....	1 66	0 00	1 53	0 35	0 15	0 00	0 18	0 05	0 00	0 73	0 35	0 81	5 86
1897 .....	0 97	2 13	0 72	0 29	0 00	0 00	0 00	0 00	0 00	0 62	0 12	0 31	5 16
1898 .....	1 36	0 28	0 26	0 05	0 20	0 00	0 00	0 00	0 65	0 00	0 26	0 10	2 16
1899 .....	0 82	0 15	0 58	0 16	0 08	0 00	0 00	T	T	0 57	1 08	0 77	4 21
1900 .....	0 84	0 26	0 43	0 78	0 48	0 00	[0 02]	0 00	0 00	0 60	1 00	T	1 41
Mean (12 years) .....	1 11	0 51	0 93	0 22	0 18	0 05	0 02	0 01	0 13	0 47	0 38	0 80	4 76

BERKELEY, ALAMEDA COUNTY

[Elevation, 320 feet ]

1887 .....	1 66	9 41	0 98	2 53	0 06	0 04	0 01	0 00	0 40	0 00	0 76	2 94	18.79
1888 .....	5 84	1 92	4 50	0 20	0 42	0 50	T	0 00	0 59	0 02	2 71	3.79	20 49
1889 .....	0 78	0 54	7 58	0 72	1 50	0 06	0 00	0 00	0 00	5 80	2 39	12.59	31 96
1890 .....	11 16	5 70	4 74	2 18	1 44	T	0 00	T	0 25	0 00	0 00	3 32	28 79
1891 .....	1 13	10 63	3 17	3 42	1 61	0 38	0 44	0 00	0 74	0 18	1 01	6 22	28 98
1892 .....	2 34	4 20	3 60	1 68	2 97	0 00	0 01	0 00	0 07	1 99	5 35	6 64	28 85
1893 .....	3 90	3 28	6 19	1 62	0 26	0 00	0 00	0 00	0 38	0 52	5 22	2 62	23 99
1894 .....	9 54	3 77	0 91	0 57	2 01	1 11	0 00	0 00	1 61	3 29	1 35	12 03	36 79
1895 .....	10 88	3 25	2 64	2 30	1 06	0 00	0 04	0 00	1 28	0 07	1 78	2 20	25 50
1896 .....	11 40	0 36	2 93	6 72	0 94	0 00	T	0 90	0 76	1 91	5.15	4 92	35.99
1897 .....	3 73	4 68	5 97	0 44	0 20	0 30	0 00	0 00	0 20	2 48	1 58	2 71	22 20
1898 .....	1 54	3 28	0 31	0 19	1 87	0 24	0 00	0 04	0 93	1 88	0 97	1 22	12 47
1899 .....	5 90	0 22	13 19	1 56	1 70	0 05	0 00	T	0 00	5 26	5 85	3 46	37 19
1900 .....	4 18	1 02	3 00	1 58	0 91	0 08	0 00	0 02	0 05	1.41	5 01	1 83	19 12
Mean (14 years) ..	5 28	3 65	4 26	1 84	1 21	0 20	0 04	0 07	0.52	1 77	2 80	4.79	26 51

BISHOP, INYO COUNTY

[Elevation, 4,450 feet ]

1884 .....	0 62	0 64	0 94	0 05	0 00	0 00	0 00	0 00	0 00	0 00	0 00	1 00	3 25
1885 .....	0 00	0 00	0 67	0 14	0 00	0 00	0 00	0 00	0 00	0 02	0 35	0 00	1.18
1886 .....	1 03	0 00	0 50	0 38	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 20	2 11
1887 .....	0 65	1 58	0 00	0 35	0.55	0 35	0 00	0 00	0 15	0 15	0.05	1 10	4 93
1888 .....	1 37	0 47	0 05	0 00	0 00	0 35	0 20	0 00	0 00	0 00	1 72	0 40	4 56
1889 .....	0 10	0 50	1 46	0 12	0 30	0 00	0 00	0 00	0 00	0 03	0 35	1.20	4 06
1890 .....	4 57	0 30	0 00	0 00	0 00	0 00	0 00	0 50	0 69	0 00	0 00	1 00	7 06
1891 .....	0 00	3 70	0 28	0 00	2 90	0 00	0 00	0 03	0 19	0 00	0 00	3 52	10 62
1892 .....	0 10	0 70	1 10	0 00	0 25	T	0 00	0 00	0 00	0 20	1 42	2 27	6.04
1893 .....	1 22	1 12	0 15	0 00	0 00	0 00	1 05	T	0 19	0 00	0.10	0 49	4 32
1894 .....	0 30	0 75	0 09	0 05	T	0 35	T	0 23	T	0 00	0 00	2 00	3 77
1895 .....	1 10	0 50	0 22	0 29	0 05	0 11	0 21	0 07	T	0 18	0 15	T	2 86
1896 .....	1 07	0 00	0 60	0 05	0 03	0 00	0 57	0 06	0 05	T	T	0.16	2.59
1897 .....	0 32	1 67	1 75	0 00	0 12	T	0 01	0 05	0 09	0 39	T	0 49	4 89
1898 .....	0 05	0 13	T	0 21	0 27	T	T	0 08	0 41	0 00	0 21	0 11	1 45
1899 .....	1 65	0 00	T	0 64	0 02	0 00	0 00	0 05	0 00	0 14	0 05	1 05	3 60
1900 .....	0 49	0 01	0 54	0 60	0 34	0 12	T	0 00	0 39	0 08	2 69	0 17	5 38
Mean (17 years) ..	0 86	0 71	0 49	0 18	0 28	0 08	0 12	0 06	0.13	0 07	0 42	0 89	4 27

## GENERAL PRECIPITATION TABLES.

169

## PRECIPITATION OF CALIFORNIA (INCHES AND HUNDREDTHS)—Continued.

## BYRON, CONTRA COSTA COUNTY.

[Elevation, 33 feet.]

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1880.....	0.92	1.02	0.79	5.13	0.18	0.00	0.00	0.00	0.00	0.00	0.53	7.56	16.13
1881.....	3.46	1.68	0.91	1.91	0.00	0.00	0.00	0.00	0.00	0.04	1.00	1.80	10.80
1882.....	1.15	1.02	3.11	0.72	0.00	0.00	0.00	0.00	0.02	0.97	1.69	0.32	9.00
1883.....	3.01	0.25	1.91	0.17	2.38	0.00	0.00	0.00	0.00	0.86	0.53	0.71	9.82
1884.....	2.41	4.15	5.61	2.50	0.00	1.54	0.00	0.00	0.00	1.23	0.00	3.33	20.77
1885.....	1.23	0.18	0.85	1.02	0.00	0.00	0.00	0.00	0.00	0.00	6.70	2.04	11.52
1886.....	4.09	0.00	1.79	2.28	0.00	0.00	0.00	0.00	0.00	0.89	0.00	0.95	9.95
1887.....	0.48	4.43	0.19	1.21	0.00	0.00	0.00	0.00	0.00	T.	0.42	2.90	9.63
1888.....	2.67	1.25	1.77	0.00	0.75	0.00	0.00	0.00	0.59	0.00	4.49	1.81	13.33
1889.....	0.71	0.72	4.24	0.49	0.98	0.12	0.00	0.00	0.00	4.52	2.86	8.33	22.97
1890.....	6.44	2.35	2.16	0.38	0.20	0.00	0.00	0.00	1.63	0.00	0.00	1.27	14.43
1891.....	0.19	2.83	0.40	1.60	0.00	0.00	0.00	0.00	0.53	0.00	0.32	3.55	9.42
1892.....	0.65	1.13	2.29	0.40	0.82	0.00	0.00	0.00	0.27	1.25	3.21	4.17	14.19
1893.....	2.57	2.34	2.43	0.90	0.38	0.00	0.00	0.00	0.00	0.00	1.50	1.33	11.45
1894.....	3.99	2.65	0.32	0.10	1.59	1.00	0.00	0.00	1.03	1.02	0.26	7.94	19.90
1895.....	4.28	1.37	0.85	1.02	0.37	0.00	0.00	0.00	0.18	0.63	0.95	0.59	10.24
1896.....	8.04	0.14	1.01	2.11	0.31	0.00	0.00	0.19	0.19	1.88	2.54	1.27	17.68
1897.....	2.44	2.52	2.88	0.00	0.00	0.00	0.00	0.00	0.00	1.47	0.18	1.06	10.55
1898.....	1.14	1.00	0.41	0.00	0.57	0.07	0.00	0.00	0.00	0.47	0.14	1.71	5.51
1899.....	2.62	0.00	5.25	0.61	0.40	0.05	0.00	0.00	0.00	3.26	1.91	1.61	15.71
1900.....	2.53	0.08	0.79	0.57	0.55	0.00	0.00	0.00	0.00	0.85	3.47	0.33	9.67
Mean (21 years).....	2.62	1.48	1.88	1.10	0.45	0.13	0.00	0.01	0.21	0.92	1.56	2.62	12.98

## CALIENTE, KERN COUNTY.

1876.....	[1.52]	2.02	1.66	0.53	T.	0.00	0.00	T.	0.00	0.52	T.	0.00	6.25
1877.....	1.08	0.47	1.08	1.27	0.52	0.00	0.00	0.00	0.00	0.00	0.84	2.31	7.57
1878.....	3.81	4.47	2.69	3.20	0.03	0.00	0.00	0.00	0.00	0.42	0.10	0.10	14.82
1879.....	0.20	0.34	0.33	1.43	0.20	0.04	0.00	0.00	0.00	1.08	1.77	3.46	8.35
1880.....	2.37	1.51	1.09	3.53	0.23	0.00	0.00	0.00	0.00	0.00	0.35	3.56	12.64
1881.....	1.61	1.54	1.91	0.64	0.23	0.00	0.00	0.00	0.13	0.81	0.30	0.51	7.68
1882.....	1.51	3.30	0.78	1.59	0.69	0.56	0.00	0.00	0.00	1.01	0.69	0.37	10.45
1883.....	0.04	1.76	0.82	2.42	1.07	0.00	0.00	0.00	0.08	0.76	0.05	1.81	8.81
1884.....	2.00	4.98	5.00	2.90	1.10	1.28	0.00	0.00	0.00	0.22	0.25	3.25	20.98
1885.....	0.25	0.00	0.45	3.00	1.05	0.00	0.05	0.00	0.00	0.05	3.88	1.33	10.06
1886.....	1.59	0.66	2.62	2.65	0.00	0.00	T.	0.00	0.00	T.	1.45	1.33	10.80
1887.....	0.38	2.76	0.07	2.66	0.21	0.00	0.00	0.00	0.00	0.63	0.05	1.43	8.22
1888.....	0.87	1.14	1.50	0.00	0.81	0.00	0.00	0.00	0.00	0.00	1.88	2.18	7.83
1889.....	0.59	0.20	3.15	0.60	0.00	0.00	0.00	0.00	0.00	1.85	1.05	8.65	10.59
1890.....	1.25	1.15	1.10	0.00	1.62	0.00	0.00	0.00	0.52	0.00	0.00	4.30	9.94
1891.....	0.19	2.83	0.40	1.60	0.00	0.00	0.00	0.00	0.53	0.00	0.82	3.55	9.42
1892.....	0.75	1.00	4.25	0.30	1.00	0.50	0.00	0.00	0.00	0.00	0.00	2.80	10.60
1893.....	1.00	2.15	3.71	0.70	0.00	0.00	0.00	0.00	0.00	0.10	0.20	3.45	11.31
1894.....	3.30	1.40	1.60	0.20	0.50	0.70	0.00	0.00	0.60	0.20	0.25	4.39	13.14
1895.....	5.28	3.10	1.67	0.85	0.87	0.00	0.00	0.00	0.00	2.31	1.51	1.20	16.79
1896.....	2.53	0.25	3.30	1.58	0.56	0.00	0.05	0.29	0.00	1.02	1.02	1.93	12.53
1897.....	1.25	4.96	2.41	0.35	0.13	0.00	0.00	0.00	0.00	0.90	0.00	2.02	12.02
1898.....	1.67	0.70	1.45	0.76	1.40	0.00	0.00	0.00	0.10	0.00	0.45	0.68	7.21
1899.....	1.73	0.41	3.26	0.28	1.13	0.00	0.00	0.00	0.00	0.25	1.52	0.64	9.22
1900.....	0.50	0.98	0.80	1.75	2.35	0.00	0.00	0.00	0.00	0.00	2.13	0.00	8.51
Mean (25 years).....	1.49	1.76	1.88	1.39	0.63	0.12	T.	0.01	0.08	0.47	0.78	2.01	10.63

## CLIMATOLOGY OF CALIFORNIA.

## PRECIPITATION OF CALIFORNIA (INCHES AND HUNDREDTHS)—Continued.

## CALISTOGA, NAPA COUNTY

[Elevation, 363 feet]

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1873..	0 20	4 43	1 28	1 43	0 00	0 00	0 00	0 00	0 00	0 63	2.75	10 19	20 91
1874..	8 55	2 57	3 48	1 55	1 10	0 00	0 00	0 00	0 00	4 01	7 98	0 46	29 70
1875..	7 89	0 56	2 18	0 00	0 00	1 52	0 00	0 00	0 00	0 45	6 79	4.08	23.42
1876..	8 53	9 08	8 73	1 87	0 20	0 00	0 00	0 00	0 36	9 05	0 48	0 00	38.10
1877..	6 55	2 49	1 64	0 65	0 50	0 28	0 20	0 00	0 00	1 49	2 14	3 02	18 96
1878..	20 64	16 46	4 80	0 85	0 80	0 00	0 00	T	0.49	1 56	1 30	1 57	48 47
1879..	4 40	6 72	15 70	2 37	2 21	0 00	0 00	0 00	0 00	0 46	5.33	7 99	45.18
1880..	3 94	1 88	1.64	15 31	1 55	0 00	0 00	0 00	0.00	0 00	0 00	15 83	40.15
1881..	15 58	4 77	1 39	1 89	0 25	0 77	0 00	0 00	0 48	2 19	0 00	5 18	32 50
1882..	3 81	5 53	3 84	1 65	0 17	0 00	0 00	0 00	0 71	3 57	4 70	1 42	25 40
1883..	1 30	1 28	5 36	2 93	3 71	0 00	0 00	0 00	1 14	1 69	0 24	1 32	18.97
1884..	6 57	4 42	9 78	5 98	0 42	2.06	0 00	0 00	0 19	1.83	0.05	15 08	46 38
1885..	2 05	1 59	0 71	0 95	0 00	0 00	0 00	0 00	0 12	0.78	15.67	5 36	27 23
1886..	9 39	T	2 23	7.12	1 05	0 00	0 00	0 00	0 00	1 25	0 00	3 95	24 99
1887..	2 22	11 18	1 58	2 82	T	0 00	0 00	0 00	0 18	0 00	1.50	4 82	24.30
1888..	7 89	2 87	5 64	0 26	0 20	1 16	0 00	0 00	0 89	0 00	6 14	6.91	31 96
1889..	0 96	0 72	10 87	1 23	3 91	0 00	0 00	0 00	0 00	9 85	4 10	17.67	49.81
1890..	18 00	4 78	9 16	2 25	1 70	0 00	0 00	0 00	0 10	0 00	0 00	4 85	40 84
1891..	1 65	13 84	1 45	3 20	1 70	0 00	0 00	0 00	0.47	0 30	0.75	8.66	31 92
1892..	5 78	5 52	5 03	3 10	0 00	0 56	0 00	0 00	0.00	1.93	8 01	10.79	40 72
1893..	5 35	8 37	9 91	3 21	0 86	0 00	0 00	0 00	0.85	0 51	6.93	4.40	40 39
1894..	15 28	7 82	3 21	2 45	2 01	1 29	0 00	0 00	1 00	2 65	1.09	15.39	52 19
1895..	22 46	2 72	3 33	1 77	1 81	0 00	0 30	0 00	1.45	T.	4 85	4.62	43 31
1896..	14 05	0 25	4 25	8 88	2 30	0 00	0 09	0.15	0 78	2 35	7.78	9.88	50 76
1897..	4 85	9 31	7 56	1 52	0 35	2 24	0 00	0 00	0 04	2.43	2.18	4.66	35.14
1898..	1 52	8 99	0 14	0 81	3 81	0 06	0 00	0 00	0 80	0 39	0.86	1.59	18.97
1899..	9 52	0 03	10 72	1 51	0 58	1.52	0 00	0 07	0 00	7.95	6 79	5.66	44.85
1900..	6 84	0 85	5 34	3.19	0 61	0.07	0 00	0 00	0 00	6.36	7.61	4.81	35 68
Mean (28 years) .	7 71	4 96	5 04	2 88	1 14	0 41	0 02	0 01	0 36	2.28	3 79	6.43	36.01

## COLFAX, PLACER COUNTY

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1870..	[8 81]	5 55	5 41	3 19	0 25	0.00	0 00	0 00	0.00	1.21	2.58	3.94	30.94
1871..	7 24	4 85	4 30	4 03	2 55	0.13	0 00	0 00	0 00	0 00	1.25	9.40	37 15
1872..	10 02	13 68	4 69	3 40	0 61	0.40	0 00	T	T.	0.00	3.99	10.48	47 27
1873..	2 90	11 12	1 24	1 81	2 04	0 00	T	0 00	0 00	0 00	2 27	18.84	40.22
1874..	10 93	6 62	10 12	3 53	1 31	0 00	0 00	0 00	0 00	3.86	13 89	1.12	50.88
1875..	12 32	0 19	3 23	0 20	1 90	0 00	0 00	0 00	0 00	0 95	14 84	7.10	40.73
1876..	10 40	7 20	14 99	3 23	1 42	T	0 00	0 00	0 00	7.98	0.62	0 00	45.24
1877..	9 29	1 76	4 36	1 36	1 67	0.57	0 00	T	0 00	0.95	3 88	1.78	25.10
1878..	13 10	12 21	9.22	1 79	0.42	T	0 00	0 00	0.56	0 00	2.08	0.85	40.23
1879..	8 73	8 87	14 62	6 57	2 91	0 27	0 00	0 00	0 00	2.94	4.68	9.16	58.75
1880..	4 53	6 60	2 85	21 09	4.29	0 00	0 00	0 00	0 00	T.	0 00	16.47	55.83
1881..	15 59	9 30	3 83	1 53	T	1 31	0 00	0 00	1.63	1.88	3 40	8.01	45.98
1882..	9 09	7 11	6 97	3 98	1 13	0 13	0 00	0 00	0.40	2.96	4 03	3.60	39 40
1883..	1 68	3 23	7 98	2 98	5 92	0 00	0 00	0 00	1 08	2 97	1.34	2.32	29.45
1884..	7 57	9 73	12 27	10 94	1 38	3 01	0 00	0 00	0 80	2.55	T.	23.80	71.85
1885..	2 85	1 66	0 68	2 29	0 00	1 18	0 00	0 00	0 62	0 00	15.48	6.77	31.53
1886..	12 17	0 34	3 69	10 86	1 08	0 00	0 00	0 00	0 00	1.96	0 46	6 12	36.68
1887..	2 99	9 24	1 51	4 92	0 72	0 00	0 00	0 00	0.68	0 84	1.81	6 00	28.51
1888..	13 28	2 18	2 80	0 95	0 17	2 69	0 00	0 00	0 25	0 10	3 28	9 57	35.27
1889..	0 50	0 90	13 90	3 00	9 14	0.25	0 00	0 00	0 00	9.95	9.60	21 85	69.09
1890..	17 90	8 00	14 70	3 95	3 85	0 00	0 00	0 00	2 75	T	0 00	4 34	55 49
1891..	1 95	14 60	9 60	2 45	1 70	2 60	0 90	0 00	0 00	0 40	1 06	11.04	46 30
1892..	4 85	7 55	7.45	5 73	6 14	0 60	0 00	0 00	[0 53]	2 20	1.55	16 95	53 55
1893..	7 62	5 68	12 80	4 22	1 80	0 00	0 00	0 00	0 85	1 23	9 32	5.06	48 10
1894..	13 43	9 76	3 63	[4 48]	3 45	2 45	0 00	0 08	1 00	5 75	0 00	24.17	68 10
1895..	16 47	5 55	4 76	0 00	4.80	0 00	0 00	0.28	2 29	0 00	1 77	8.35	44 77
1896..	23 23	0 93	6 36	16 15	5 39	0 00	0 00	0.10	1 64	1.62	14 39	5 58	75 39
1897..	4 15	15 86	7 46	0 00	0 00	0 85	0 00	0 00	T	3 86	3 28	5.80	41.23
1898..	1 80	9 61	1 89	1 33	2 98	1 50	0 00	0 00	0 86	1 42	4 46	3.01	28.41
1899..	9 29	0 87	20 73	1 16	2 41	1 72	0 00	0 30	0 00	9 63	13.06	12.38	72.00
1900..	6.41	4 38	7 79	5 74	3.12	0 10	0 00	0 00	1.00	7.33	12 27	3 96	52.10
Mean 31 (years) .	8.75	6 62	7 26	4 42	2 39	0 64	0 08	0 02	0 53	2 37	4 93	8 68	46 63

## PRECIPITATION OF CALIFORNIA (INCHES AND HUNDREDTHS)—Continued.

## COLTON, SAN BERNARDINO COUNTY.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1877.....	1.64	T.	1.72	1.00	1.58	0.00	0.00	0.00	0.00	0.07	0.85	1.98	8.29
1878.....	1.94	5.16	1.88	2.99	0.71	0.00	0.00	0.00	0.00	0.24	0.80	1.68	14.40
1879.....	1.79	0.74	0.08	1.75	0.10	0.08	0.00	0.00	0.00	0.13	1.15	2.49	8.26
1880.....	0.99	0.76	1.05	2.19	0.00	0.00	0.00	0.00	0.00	0.13	0.27	2.87	7.76
1881.....	0.74	0.90	1.89	0.28	0.00	0.00	0.00	0.00	0.00	0.28	0.88	0.00	8.97
1882.....	2.23	1.28	1.51	1.08	0.00	0.50	0.50	0.00	0.00	0.50	0.19	0.80	8.09
1883.....	0.52	1.72	1.00	0.45	0.75	0.00	0.00	0.00	0.00	0.60	0.00	2.23	7.27
1884.....	1.00	11.88	4.05	2.85	2.90	0.32	0.00	0.25	0.00	0.25	0.12	3.93	27.05
1885.....	1.00	0.00	0.00	2.08	0.22	0.00	0.00	0.00	0.00	0.00	1.92	0.52	5.74
1886.....	2.78	0.40	3.54	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.80	0.00	8.02
1887.....	0.21	3.64	0.00	1.94	T.	0.00	0.00	0.00	0.00	0.00	0.70	0.80	7.29
1888.....	4.89	0.42	3.68	0.43	0.00	0.00	0.00	0.00	0.00	0.00	2.87	3.26	15.05
1889.....	0.86	0.88	4.47	1.02	0.60	0.00	0.00	T.	0.04	1.59	1.26	7.41	18.13
1890.....	2.94	1.15	0.50	0.00	0.00	0.00	0.00	0.06	0.67	0.00	0.19	2.45	7.96
1891.....	0.00	6.48	0.25	0.80	0.90	0.00	0.00	0.00	0.00	0.00	0.00	0.87	9.80
1892.....	2.27	3.36	0.80	0.24	1.44	0.00	0.00	0.00	0.00	[0.48]	0.90	1.45	10.94
1893.....	2.40	2.91	6.64	0.16	0.00	0.00	0.30	0.00	0.00	1.18	0.22	1.98	15.74
1894.....	0.20	0.55	2.00	0.10	0.50	0.00	0.00	0.00	0.45	0.15	0.00	5.70	9.65
1895.....	6.88	1.01	2.94	1.08	1.05	0.00	0.00	0.00	0.00	0.00	1.18	0.00	14.12
1896.....	1.10	0.00	2.91	0.25	0.88	0.00	0.00	0.10	[0.06]	2.28	0.94	1.11	9.13
1897.....	3.52	3.96	2.70	0.00	0.15	0.85	0.00	0.00	0.00	2.20	[0.66]	0.80	14.34
1898.....	1.48	0.23	0.80	0.10	0.34	0.00	0.00	0.00	0.00	T.	T.	0.45	8.40
1899.....	1.57	0.45	1.55	0.00	0.00	T.	0.00	0.00	0.00	0.00	1.96	0.55	6.08
1900.....	1.06	0.00	0.95	1.59	0.89	0.00	0.00	0.00	T.	0.82	6.47	0.00	11.28
Mean (24 years) .....	1.83	1.97	1.91	0.95	0.52	0.07	0.03	0.02	0.05	0.43	0.93	1.74	10.47

## CORNING, TEHAMA COUNTY.

1886.....	5.68	0.00	1.41	3.45	0.58	0.00	0.00	0.00	0.00	0.30	0.00	2.01	13.43
1887.....	0.45	6.81	1.46	2.86	0.28	0.18	0.00	0.00	0.00	0.00	1.87	3.70	17.11
1888.....	3.64	2.09	3.20	0.19	0.40	0.79	T.	0.00	0.52	0.00	3.34	5.37	19.54
1889.....	0.27	0.76	4.37	0.55	1.88	0.65	0.00	0.00	0.00	5.74	3.26	10.11	27.09
1890.....	5.10	2.28	4.56	1.25	2.94	0.00	0.00	0.00	0.78	0.00	0.00	2.26	18.57
1891.....	0.70	11.80	1.52	2.13	1.15	0.45	0.00	0.00	0.00	0.50	0.10	2.91	21.26
1892.....	3.25	1.35	2.20	1.41	1.63	0.05	0.00	0.00	0.00	0.14	9.07	2.51	21.61
1893.....	2.42	3.00	5.00	1.80	0.22	0.00	0.00	0.00	0.22	0.00	2.60	2.22	17.48
1894.....	3.90	4.30	0.85	0.40	1.30	0.00	0.00	0.00	0.00	[0.23]	0.85	0.00	22.68
1895.....	14.62	2.83	3.42	0.90	0.20	0.00	0.00	0.00	0.00	[0.23]	0.00	1.25	25.62
1896.....	12.40	T.	3.95	3.95	1.30	0.00	0.00	0.42	0.75	0.75	3.08	7.40	34.00
1897.....	2.29	5.69	1.90	1.63	T.	0.60	0.00	0.00	0.00	2.18	0.65	1.60	16.54
1898.....	0.20	3.20	0.00	T.	1.28	0.00	0.00	0.00	0.88	0.75	0.72	1.05	7.58
1899.....	3.13	0.00	3.08	0.95	1.15	0.18	0.00	0.00	0.00	6.76	4.10	3.42	27.72
1900.....	4.61	1.34	1.60	2.84	0.76	0.30	0.00	0.00	0.00	4.05	3.80	2.25	21.55
Mean (15 years) .....	4.51	3.08	2.56	1.62	0.98	0.21	T.	0.03	0.21	1.47	2.22	3.99	20.79

a Approximated.

## PRECIPITATION OF CALIFORNIA (INCHES AND HUNDREDTHS)—Continued

## DAVISVILLE, YOLO COUNTY

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1872	4 34	1 92	0 06	0 00	0 11	T	0 00	T	T	0 00	1 50	6 50	11 43
1873	1 00	2 26	0 50	0 19	0 00	0 00	0 00	0 00	0 00	0 20	0 27	9 68	14 10
1874	3 39	1 46	2 50	0 55	0 25	0 00	0 00	0 00	0 00	1 60	2 50	0 10	12 35
1875	5 75	0 00	0 88	0 00	0 10	0 75	0 00	0 00	0 00	0 16	3 86	2 60	13 60
1876	3 53	3 69	3 67	1 01	0 20	0 00	0 20	0 02	T	0 00	0 00	0 00	12 32
1877	2 84	1 12	0 50	0 12	0 32	0 00	T	0 00	0 00	0 78	0 34	1 00	6 97
1878	8 72	6 49	1 75	0 66	0 31	0 00	0 00	0 00	0 15	0 34	1 00	0 19	19 61
1879	2 38	2 65	3 80	1 04	1 20	0 18	0 00	0 00	0 00	0 36	1 79	2 72	16 12
1880	1 80	1 17	1 16	7 46	0 57	0 00	0 00	0 00	0 00	0 00	0 00	10 47	22 63
1881	3 94	2 12	1 19	1 13	0 00	0 00	0 00	0 00	0 23	0 28	1 65	2 38	12 92
1882	1 28	1 92	2 76	1 13	0 00	0 00	0 00	0 00	0 19	1 78	2 81	0 68	12 58
1883	2 20	0 71	3 19	1 00	3 19	0 00	0 00	0 00	0 72	0 90	0 35	0 43	12 69
1884	3 07	3 78	5 09	3 07	0 00	1 39	0 00	0 00	0 28	1 48	0 00	5 25	23 41
1885	1 32	0 14	0 10	1 22	0 00	0 00	0 00	0 00	0 05	0 00	7 87	1 56	15 26
1886	5 32	0 20	1 70	4 75	0 05	0 00	0 00	0 00	0 00	0 48	0 00	1 81	11 31
1887	0 99	6 14	0 78	2 03	0 00	0 00	0 00	0 00	0 05	0 00	0 50	2 52	13 01
1888	4 23	1 10	2 80	0 30	0 50	0 00	0 00	0 00	0 65	0 00	5 06	1 20	18 84
1889	0 20	0 41	6 62	1 17	1 48	0 34	0 00	0 00	0 00	8 14	3 01	9 02	30 12
1890	6 36	3 69	3 35	1 60	2 21	0 00	0 00	0 00	0 62	0 00	0 00	5 28	23 11
1891	1 10	10 55	1 45	1 68	0 70	0 00	0 00	0 00	0 00	0 00	0 47	2 51	18 46
1892	1 72	2 05	2 67	0 92	2 08	0 00	0 00	0 00	0 00	0 51	2 78	6 77	19 50
1893	3 45	4 09	4 32	0 85	1 56	0 00	0 00	0 00	0 00	0 10	2 97	2 01	19 33
1894	3 50	2 05	0 94	0 30	1 64	1 65	0 00	0 00	0 93	1 01	0 35	7 59	19 96
1895	8 47	1 85	1 30	0 64	0 44	0 00	0 50	0 00	1 00	T	1 16	1 03	16 39
1896	9 24	0 15	2 06	5 86	0 71	0 00	0 00	0 32	0 98	1 02	3 74	2 23	26 31
1897	3 23	4 13	2 63	0 28	0 23	0 03	0 00	0 00	T	1 66	0 63	1 06	13 88
1898	1 11	3 07	0 04	0 24	1 15	0 00	0 00	0 00	0 25	0 30	0 46	1 58	8 20
1899	3 82	T	5 67	T	0 31	0 80	0 00	0 02	0 00	3 88	1 88	1 42	17 80
1900	3 55	0 20	0 96	0 98	0 40	T	0 00	0 00	0 00	0 38	4 08	0 94	11 49
Mean (29 years)	3 51	2 38	2 20	1 39	0 68	0 18	0 02	0 01	0 21	0 87	1 76	3 33	16 55

## DELANO, KERN COUNTY

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1876	1 23	1 82	0 82	0 00	0 00	0 00	0 00	0 00	0 00	0 23	0 00	0 00	4 10
1877	0 55	0 49	1 63	1 02	0 23	0 00	0 00	0 00	0 00	0 00	0 36	0 56	4 84
1878	1 25	1 96	1 55	1 41	0 00	0 00	0 00	0 00	0 00	0 07	0 00	0 00	6 24
1879	0 18	0 10	0 07	0 98	0 06	0 00	0 00	0 00	0 00	0 43	0 71	1 16	3 67
1880	0 55	2 97	0 30	2 40	0 20	0 00	0 00	0 00	0 00	0 00	0 05	2 60	9 07
1881	1 85	0 60	1 10	0 50	0 05	0 00	0 00	0 00	0 02	0 30	0 42	T	4 81
1882	0 51	1 10	0 83	0 83	0 50	0 00	0 00	0 00	0 05	0 55	1 00	0 00	5 37
1883	0 00	0 40	0 88	0 50	3 58	0 00	0 00	0 00	0 00	0 26	0 00	0 49	6 06
1884	1 61	2 38	1 98	2 31	2 27	0 22	0 00	0 00	0 00	0 00	0 16	2 16	13 09
1885	0 13	0 00	0 36	1 15	0 03	0 00	0 00	0 00	0 00	0 15	3 55	1 60	6 97
1886	0 75	0 20	0 80	1 54	0 00	0 00	0 00	0 00	0 00	T	0 69	0 31	4 32
1887	0 20	2 63	0 00	1 44	0 68	0 00	0 00	0 00	0 00	0 00	0 03	0 60	5 58
1888	2 21	0 10	0 94	0 00	0 15	0 00	0 00	0 00	0 00	0 00	1 15	1 19	6 10
1889	0 68	0 05	2 10	0 22	0 16	0 00	0 00	0 00	0 00	0 00	2 46	0 56	8 11
1890	2 67	0 62	0 42	0 08	0 61	0 00	0 00	0 00	0 52	0 00	0 19	1 31	6 42
1891	0 18	1 99	0 57	0 27	0 05	0 19	0 00	0 00	0 38	0 00	0 16	1 60	5 89
1892	0 42	0 85	2 07	0 13	0 43	0 37	0 00	0 00	0 00	0 32	0 35	0 98	5 92
1893	0 59	1 10	2 42	0 24	0 00	0 00	0 00	0 00	0 00	0 00	0 30	1 33	5 98
1894	0 47	0 45	0 64	0 16	0 07	0 55	0 00	0 00	0 35	0 16	0 00	1 75	4 60
1895	2 79	0 63	0 34	0 31	0 33	0 00	0 00	0 00	T	0 65	0 90	0 12	6 07
1896	1 25	0 00	0 84	0 28	0 00	0 00	0 25	0 00	0 00	0 73	0 62	0 70	4 67
1897	1 35	2 29	0 86	0 18	0 00	0 00	0 00	0 00	0 00	0 88	0 14	0 31	6 01
1898	0 78	0 62	0 38	0 00	0 25	0 00	0 00	0 00	2 78	T	T	0 30	5 11
1899	0 68	T	1 39	0 08	0 09	1 25	0 00	T	0 00	0 78	1 29	1 01	6 57
1900	0 69	0 97	0 51	0 89	0 91	0 00	0 00	0 00	T	0 00	2 20	0 14	6 31
Mean (25 years)	0 94	0 97	0 95	0 67	0 43	0 10	0 01	T	4 10	7 97	15 22	22 18	6 06



## PRECIPITATION OF CALIFORNIA (INCHES AND HUNDREDTHS)—Continued.

## DELTA.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1883.....	1.00	0.00	14.46	8.49	9.94	0.00	0.00	0.00	0.00	6.18	1.10	4.24	45.41
1884.....	15.57	4.55	13.44	16.55	2.78	7.12	0.25	0.00	1.03	6.01	0.56	16.24	84.05
1885.....	2.91	2.53	0.37	2.54	0.67	1.80	0.00	0.00	0.00	0.60	29.38	12.94	53.54
1886.....	9.95	0.50	3.52	10.19	8.16	0.60	0.00	0.00	T.	1.30	0.30	8.81	43.33
1887.....	3.84	10.27	3.37	5.53	1.26	0.82	0.00	0.00	0.00	0.00	0.75	2.23	28.07
1888.....	10.40	4.67	1.70	0.00	2.45	3.30	0.00	0.00	0.16	7.14	7.18	10.56	47.56
1889.....	0.15	1.02	37.52	2.91	5.81	1.07	0.00	0.00	0.00	26.71	10.08	25.88	111.05
1890.....	17.18	21.11	16.50	4.78	2.33	0.00	0.00	0.00	1.00	0.40	0.00	7.24	70.54
1891.....	3.72	13.70	2.06	8.95	4.76	1.98	0.75	0.00	1.31	2.24	1.99	7.21	43.67
1892.....	5.55	4.01	8.34	6.31	5.22	0.04	0.10	0.00	1.52	3.40	13.08	19.51	67.08
1893.....	3.17	2.10	11.90	8.90	3.30	0.00	T.	0.00	2.85	0.15	8.05	3.60	44.02
1894.....	14.30	3.70	2.60	2.75	3.50	2.25	0.00	T.	4.00	7.33	3.30	33.17	76.90
1895.....	18.55	7.03	7.72	1.71	4.08	0.00	1.07	0.00	5.18	0.00	2.15	6.38	53.87
1896.....	31.42	0.60	11.81	16.72	6.92	0.07	0.00	T.	T.	3.50	12.00	17.23	100.27
1897.....	4.06	7.13	4.63	1.30	0.00	2.75	0.00	0.00	0.00	3.40	3.56	6.05	33.47
1898.....	0.75	13.55	0.00	1.85	5.85	1.40	0.00	0.00	0.00	1.95	3.35	2.00	30.20
1899.....	8.19	5.95	11.81	0.65	1.10	4.05	0.00	0.00	0.00	9.35	19.60	6.40	67.60
1900.....	12.25	4.60	9.45	8.59	4.10	1.56	0.17	0.20	0.97	15.68	10.51	8.04	76.12
Mean (18 years).....	9.09	5.95	8.96	6.01	4.01	1.59	0.13	0.01	1.00	5.32	7.05	10.98	60.10

## DUNNIGAN, YOLO COUNTY.

1877.....	2.19	0.86	0.31	0.00	0.12	0.00	T.	0.00	0.00	0.69	0.92	0.33	5.92
1878.....	10.50	6.28	1.94	0.44	0.52	0.00	0.00	0.00	0.00	0.52	0.31	0.01	21.02
1879.....	2.35	2.10	4.39	1.22	0.86	0.15	0.00	0.00	0.00	0.06	2.07	2.89	16.09
1880.....	0.70	0.88	0.87	6.06	0.40	0.00	0.00	0.00	0.00	0.00	0.05	10.23	19.19
1881.....	5.67	1.45	0.67	1.23	0.20	0.15	0.00	0.00	0.77	0.38	0.52	3.22	14.26
1882.....	1.00	2.04	2.33	1.23	0.00	0.12	0.00	0.00	0.42	1.19	2.63	0.55	11.51
1883.....	2.05	0.35	3.05	0.72	4.67	0.00	0.00	0.00	0.53	0.72	0.45	0.35	13.49
1884.....	2.36	3.21	5.78	2.78	T.	2.59	0.00	0.00	0.04	1.28	0.00	7.16	25.20
1885.....	1.66	0.32	0.13	1.10	0.00	0.00	0.00	0.00	0.05	1.45	10.47	3.68	18.86
1886.....	8.37	T.	1.69	3.61	0.18	0.00	0.00	0.00	0.00	0.51	T.	1.91	16.27
1887.....	0.97	6.93	1.13	2.41	0.00	0.00	0.00	0.00	0.00	0.00	0.33	3.30	15.57
1888.....	4.18	1.03	3.39	0.00	1.62	0.00	0.00	0.00	0.59	0.00	4.59	5.88	21.28
1889.....	0.27	0.60	0.17	1.49	1.46	0.28	0.00	0.00	0.00	6.39	3.59	9.66	29.91
1890.....	7.22	3.62	3.90	1.16	1.91	0.00	0.00	0.00	0.64	0.00	0.00	3.13	21.63
1891.....	0.59	9.60	0.66	9.09	1.75	0.00	0.00	0.00	0.45	0.00	0.43	3.13	18.80
1892.....	2.60	2.25	2.78	0.87	2.18	0.00	0.00	0.00	0.00	0.00	1.12	6.92	27.95
1893.....	3.46	3.64	4.64	0.94	0.69	0.00	0.00	0.00	0.00	0.00	1.60	1.30	16.27
1894.....	5.78	2.06	0.93	0.48	1.78	0.36	0.00	0.00	1.00	1.76	0.23	11.22	25.65
1895.....	10.33	0.76	1.23	1.46	0.30	0.00	0.04	0.00	1.59	0.38	1.41	1.26	13.81
1896.....	15.13	0.11	2.80	5.45	0.79	0.00	0.04	0.37	0.43	1.30	3.65	4.32	34.44
1897.....	3.90	4.99	1.52	0.42	0.26	0.35	0.00	T.	0.08	2.00	0.49	1.69	15.70
1898.....	2.03	3.24	0.25	0.14	1.67	0.09	0.00	0.00	1.95	0.60	0.35	1.28	11.60
1899.....	7.00	T.	4.29	0.30	0.44	0.61	0.00	0.00	0.00	3.33	3.39	3.65	23.01
1900.....	4.15	0.10	2.10	1.48	0.86	0.00	0.00	0.00	T.	1.01	4.27	2.05	16.02
Mean (24 years).....	4.36	2.35	2.40	1.54	0.94	0.20	T.	0.02	0.36	1.03	2.07	3.33	19.10

## CLIMATOLOGY OF CALIFORNIA.

## PRECIPITATION OF CALIFORNIA (INCHES AND HUNDREDTHS)—Continued

## DUNSMUIR, SISKIYOU COUNTY

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept.	Oct	Nov	Dec	Annual
1889 ..	1 30	0 33	4 39	2 43	7 06	1 12	0 00	0 00	0 00	20 15	11.65	20 57	69 00
1890 ..	23 60	16 50	11 85	11 85	2 45	0 40	0 00	0 05	0 90	0 00	0 00	8 05	75.60
1891 ..	0 55	2 59	2 70	4 95	3 07	2 88	0 67	0 07	1 52	2 13	2 32	9 65	33 10
1892 ..	2 41	3 31	5 30	5 48	3 96	1 22	0 35	0 00	0 05	2 68	7 47	14 03	46 26
1893 ..	3 65	6 40	13 30	8 75	4 06	0 00	0 20	0 00	3 27	1 15	11 35	5.08	57 21
1894 ..	17 53	7 60	6 05	1 70	4 35	2 10	0 00	0 20	9 65	2 90	29 30	81 58	50 09
1895 ..	15 30	6 50	8 15	2 55	4 40	0 00	1 55	0 00	5 75	0 05	1 40	4 39	78 05
1896 ..	22 25	1 54	10 23	11 43	6 22	0 17	0 34	0 00	1 46	0 00	11 07	13 94	36 65
1897 ..	4 08	10 63	6 33	1 02	0 14	2 35	0 00	0 00	0 00	2 78	4 34	4 98	43.93
1898 ..	9 76	10 62	0 00	1 20	4 20	1 50	0 00	0 00	0 53	1 71	2 98	11 43	52 28
1899 ..	6 80	0 50	10 31	0 48	1 60	1 90	0 00	0 90	T	7 10	15 29	7 40	51.23
1900 ..	9 93	3 32	6 27	4 85	3 18	0 90	0 00	T	1 20	6 13	7 16	8 29	56.30
Mean (12 years) . . .	9 76	5 82	7 07	4 72	3 72	1 21	0 26	0 10	1 24	4 46	6 49	11 43	

## ELDORADO, ELDORADO COUNTY

[Elevation, 1,609 feet]

1889. . .	0 31	0 38	8 41	1 60	7 50	0 12	0 00	0.00	0 00	7 46	6.32	14 91	17 04
1890 ..	12 48	5 74	10 09	3 00	3 45	0 00	0 00	.	1 77	0 10	0 00	5.48	42.11
1891 ..	1 07	6 93	6 71	3 52	0 93	0 95	0 00	0 00	0 09	0 85	1 08	9 09	31.22
1892 ..	3 48	5 75	7 24	3 61	4 91	0 15	0 00	0 00	0 08	2 04	7 80	10.33	45 39
1893.....	5 40	2 56	8 02	3 13	1 51	0 00	0 00	0 00	1 14	0 65	4 58	4 26	31.25
1894 ..	8 74	11 90	2 25	1 63	3 98	1 00	0 00	0 00	0.67	8 52	1 05	14.37	49 11
1895 ..	13 30	4.18	3 94	4 06	2 34	0 00	0 00	0 00	1 41	0 00	0 78	3 79	34.30
1896 ..	13 82	0 15	7 80	9 56	2 59	0 00	0 00	0 03	0 41	1 00	9 49	8.62	48 47
1897 ..	3 51	4 50	7 63	1 65	0 23	0 55	0 00	0 00	0 17	2 54	2 21	2.88	25 87
1898 ....	1 43	6 19	0 86	0 53	2 67	0 60	0 00	0 00	0.37	0 95	2 45	2 70	18.75
1899 ....	4 60	0 57	13 10	1 02	1 80	1 57	0 00	0 06	0 00	7 18	6 19	6.73	42.82
1900 ..	3 87	1 99	5 15	3 40	1 70	0 00	0 00	0.00	0 10	3 26	8.11	2 23	29.81
Mean (12 years) . . .	6 04	4 24	6 77	3 06	2 80	0 41	0 00	0 01	0.52	2 46	4 17	6.70	37.18

## ELMIRA, SOLANO COUNTY

[Elevation, 75 feet]

1886 ..	8 01	0 00	1 35	4 22	0 14	0 00	0 00	0 00	0 00	0.38	0 00	2 72	16 82
1887 ..	1.01	7 10	0 55	2 06	0 00	0 00	0 00	0 00	0 00	0 00	0.76	3.41	14 89
1888 ..	4 81	1 49	3 92	T	0 45	0 19	0 00	0 00	0 08	0 00	0 28	4.47	15.69
1889 ..	0 32	0 88	6 32	0 59	1 67	0 15	0 00	0 00	0 00	6.54	0 20	9 96	20.63
1890 ..	8 68	4 08	5 26	1 05	1 86	0 00	0 00	0 00	0 35	0 00	0 00	3.74	25.02
1891 ....	0 75	8 87	1 65	1 72	0 50	0 00	0 00	0 00	0 35	0 00	0 27	4 92	19 03
1892 ..	2 81	4 04	1 94	1 77	2 82	0 00	0 00	0 00	0 08	0 84	5 00	8.19	27.49
1893 ....	4 71	2 85	4 40	0 90	0 76	0 00	0 00	0 00	0 16	0 18	3 02	1.76	18.74
1894 ..	8 12	4 20	0 97	0 57	1 08	0 63	0 00	0 00	1 44	3 17	0.51	12 43	33.52
1895 ..	11 61	3 11	1 50	1 57	0 68	0 00	0 00	0 00	0 87	0 04	2 38	1 91	23.67
1896 ..	16 16	0 31	4 63	7 68	0 87	0 00	0 00	0 80	0 30	1 15	6 14	3 49	41.33
1897 ..	3 72	7 15	4 52	0 39	0 00	0 03	0 00	0 00	0 06	2 34	0 79	2 25	21 25
1898 ....	0 93	3 33	0 19	0 46	1 33	0 00	0 00	0 00	0 19	0 27	0 22	1 36	8 28
1899 ....	5 33	0 00	7 60	0 58	0 03	1 41	0 00	0 21	0 00	4 18	3 31	3 50	26 15
1900 ..	3 36	0 43	1 91	1 18	0 58	0 00	0 00	0 00	0 00	1 04	5 89	1 41	15 80
Mean (15 years) . . .	5 36	3 19	3 11	1 65	0 85	0 16	0 00	0 05	0 26	1.84	1 92	4.39	22.29

## PRECIPITATION OF CALIFORNIA (INCHES AND HUNDREDTHS)—Continued.

## FALLBROOK, SAN DIEGO COUNTY.

[Elevation, 700 feet.]

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1876.....	6.17	3.78	2.77	0.15	0.61	0.00	0.15	0.00	0.20	0.23	0.07	0.08	14.21
1877.....	3.41	0.59	2.28	0.55	1.11	0.00	0.00	T.	0.00	0.59	0.58	4.02	13.13
1878.....	3.19	8.01	2.08	4.63	1.41	0.33	0.00	T.	0.00	0.32	0.25	1.64	21.86
1879.....	3.21	0.90	0.29	0.83	0.03	0.23	0.00	0.05	0.00	0.42	3.61	5.87	15.44
1880.....	1.46	1.86	2.12	4.99	0.05	0.02	0.03	0.26	[0.11]	[0.74]	[1.27]	[3.22]	16.13
1881.....	[3.51]	0.73	2.93	0.67	0.00	0.00	0.00	0.00	0.00	0.57	0.24	0.35	9.00
1882.....	2.65	4.02	2.42	1.64	0.09	0.26	T.	0.12	0.03	0.70	1.01	0.33	13.27
1883.....	3.46	2.68	1.89	1.23	1.87	0.00	0.00	0.00	0.00	2.96	0.00	3.32	17.41
1884.....	3.56	15.36	10.90	3.13	1.02	0.52	0.00	0.02	0.20	0.53	0.54	7.07	42.85
1885.....	0.92	0.13	0.29	2.60	0.29	0.11	0.00	0.02	0.00	0.00	5.92	1.13	11.41
1886.....	9.76	1.13	4.70	3.43	0.00	0.14	T.	0.11	0.12	0.04	1.95	0.80	21.68
1887.....	0.28	5.65	0.05	2.02	0.24	0.06	0.05	0.00	0.33	0.20	2.03	3.56	14.97
1888.....	3.89	2.55	5.88	0.28	0.81	0.02	0.03	0.00	0.00	0.80	3.48	6.13	23.87
1889.....	1.49	2.35	7.97	0.63	0.47	0.11	0.00	0.07	0.05	2.11	0.53	15.53	31.36
1890.....	5.14	2.22	0.80	0.09	0.30	0.02	0.00	0.26	0.49	0.00	0.58	3.22	13.12
1891.....	0.40	11.93	0.56	1.35	0.89	0.00	0.02	0.00	0.13	0.02	0.01	2.64	17.95
1892.....	1.10	4.59	2.71	0.62	1.46	0.19	0.00	0.00	0.00	0.32	2.35	2.14	15.98
1893.....	3.40	3.72	3.06	0.49	0.29	0.00	0.13	0.00	0.06	0.86	1.46	3.53	22.05
1894.....	0.87	1.10	1.36	0.08	0.31	0.00	0.04	0.18	0.38	0.06	0.00	6.09	10.47
1895.....	12.52	1.59	2.14	0.61	0.24	0.00	0.00	0.00	0.00	0.06	1.46	0.47	19.09
1896.....	3.45	T.	3.44	0.26	0.13	0.00	0.05	0.05	0.00	2.68	1.22	2.13	13.41
1897.....	4.20	6.61	4.37	0.06	0.21	0.00	0.01	T.	T.	2.82	0.17	0.88	18.88
1898.....	2.65	0.71	1.43	0.46	2.23	0.07	T.	T.	T.	0.00	0.02	1.04	8.66
1899.....	3.51	0.66	2.23	0.16	0.18	0.90	0.00	0.03	0.00	1.25	2.90	2.22	14.04
1900.....	3.26	0.29	0.76	1.00	1.76	T.	0.00	0.00	0.06	0.23	5.06	0.00	12.42
Mean (25 years).....	3.50	3.33	2.98	1.28	0.64	0.12	0.02	0.05	0.11	0.74	1.49	3.06	17.30

## FARMINGTON, SAN JOAQUIN COUNTY.

[Elevation, 111 feet.]

1877.....	5.71	5.07	0.86	1.25	0.29	0.04	0.00	0.00	0.00	0.19	0.90	1.62	15.98
1878.....	6.43	4.91	3.05	0.63	0.00	0.00	0.00	0.00	T.	0.55	0.51	0.41	16.49
1879.....	2.73	2.81	3.15	1.99	1.01	0.30	0.00	0.00	0.00	0.70	0.86	2.25	15.80
1880.....	1.63	1.80	1.08	7.31	1.31	0.00	0.00	0.00	0.00	T.	0.40	6.04	19.57
1881.....	2.40	2.78	1.30	0.18	0.00	0.10	0.00	0.00	0.17	0.44	0.55	1.62	9.54
1882.....	2.10	2.35	3.05	2.55	0.13	0.13	0.00	0.00	0.30	2.23	1.90	1.51	16.25
1883.....	2.70	0.78	2.90	1.42	3.06	0.00	0.00	0.00	0.78	1.66	0.79	0.73	14.30
1884.....	1.44	5.04	6.53	4.72	0.35	1.32	0.00	0.00	0.09	1.15	0.00	6.21	26.85
1885.....	1.03	0.00	0.16	0.46	0.00	0.17	0.00	T.	T.	0.00	6.95	1.37	10.14
1886.....	4.60	0.41	1.87	5.01	0.19	0.00	0.00	0.00	0.00	0.27	0.89	1.37	14.61
1887.....	0.36	3.37	0.29	2.89	0.00	T.	0.00	0.00	0.39	T.	0.20	2.32	9.82
1888.....	3.82	0.15	3.52	0.07	0.92	0.00	T.	0.00	0.66	0.00	2.93	1.75	13.82
1889.....	0.30	0.70	3.07	0.20	1.88	T.	0.00	0.00	0.00	2.82	3.22	8.00	20.19
1890.....	4.63	1.87	1.78	1.37	1.14	0.00	0.00	0.00	0.63	0.00	0.00	1.96	13.38
1891.....	0.43	6.35	4.04	1.65	0.40	0.00	0.00	0.00	0.00	0.08	0.24	4.01	17.20
1892.....	0.97	2.20	2.83	1.23	2.59	0.18	0.00	0.00	0.13	0.69	2.38	6.70	20.00
1893.....	3.27	2.41	6.16	0.92	0.40	0.00	0.00	0.00	0.46	0.00	2.19	1.65	17.46
1894.....	5.17	5.17	0.13	0.50	2.80	0.68	0.00	0.00	0.75	1.51	0.72	7.74	25.17
1895.....	6.01	2.29	1.46	0.53	0.45	0.00	0.00	0.00	0.03	0.19	1.49	1.26	13.71
1896.....	6.20	0.27	1.89	4.13	0.55	0.00	0.00	0.00	0.00	1.40	3.72	1.77	19.93
1897.....	3.09	5.03	2.92	0.42	0.30	0.00	0.00	0.00	0.00	1.69	0.74	1.33	15.57
1898.....	0.76	2.02	0.97	0.20	1.54	0.00	0.00	0.00	0.53	0.66	-0.30	1.53	9.06
1899.....	3.00	0.14	5.33	0.78	1.07	0.10	0.00	0.10	0.00	3.77	3.03	2.33	19.70
1900.....	1.75	0.40	1.23	3.77	1.56	0.00	0.00	0.00	T.	1.44	5.62	1.01	16.33
Mean (24 years).....	2.94	2.43	2.49	1.84	0.91	0.13	T.	T.	0.21	0.89	1.71	2.77	16.33

## CLIMATOLOGY OF CALIFORNIA.

## PRECIPITATION OF CALIFORNIA (INCHES AND HUNDREDTHS)—Continued

## FERNANDO, LOS ANGELES COUNTY

[Elevation, 1,066 feet ]

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept,	Oct	Nov	Dec	Annual
1878 . . . . .	4 15	6 89	2 08	2 55	0 86	0 00	0 00	0 00	0 00	0 16	0 09	1 20	17 48
1879 . . . . .	3 97	0 86	0 18	1 41	0 00	0 00	0 00	0 00	0 00	0 33	2 15	6 29	15 19
1880 . . . . .	0 94	2 00	1 14	2 97	0 00	0 00	0 00	0 00	0 00	0 00	0 86	4 72	12 63
1881 . . . . .	1 28	0 84	1 75	0 50	0 00	0 00	0 00	0 00	0 00	0 95	0 16	0 32	5 30
1882 . . . . .	0 62	1 70	3 21	1 56	0 10	0 00	0 00	0 00	0 00	0 28	0 68	0 00	8 15
1883 . . . . .	1 32	3 17	1 30	0 13	2 12	0 00	0 00	0 00	0 00	0 70	0 00	2 76	11 50
1884 . . . . .	3 00	10 60	10 51	3 48	1 05	2 00	0 00	0 00	0 00	0 42	1 00	4 96	87 02
1885 . . . . .	0 90	0 00	T	1 48	0 21	0 00	0 00	0 00	0 00	0 00	7 94	1 17	11 70
1886 . . . . .	6 70	T	3 36	3 39	0 00	0 00	0 19	T	0 00	0 78	0 87	0 24	15 53
1887 . . . . .	0 21	8 54	0 27	2 52	T	0 00	0 00	0 00	[0 04]	0 22	0 90	1 41	14 11
1888 . . . . .	5 09	1 39	3 40	0 44	0 00	0 00	0 00	0 00	0 00	0 36	3 24	5 40	19 32
1889 . . . . .	0 09	0 63	8 95	0 56	0 43	0 00	0 00	0 06	0 32	6 17	1 60	14 40	33 21
1890 . . . . .	5 40	2 72	0 53	0 05	0 10	0 00	0 00	0 00	0 36	0 00	0 18	1 61	10 95
1891 . . . . .	0 30	6 32	1 23	0 96	0 98	0 00	0 00	0 00	0 12	0 00	0 00	1 03	10 91
1892 . . . . .	0 57	2 53	2 65	0 21	1 68	0 00	0 00	0 00	0 00	0 40	1 48	4 40	13 92
1893 . . . . .	2 63	3 67	6 93	0 56	0 08	0 00	0 00	0 00	0 00	0 61	0 05	2 23	18 76
1894 . . . . .	0 59	0 61	0 75	0 24	0 32	0 00	0 00	0 00	0 00	0 02	0 00	5 82	8 35
1895 . . . . .	7 62	0 54	3 72	0 55	0 28	0 00	0 00	0 00	0 00	0 21	0 90	0 61	14 13
1896 . . . . .	2 42	0 05	3 32	0 29	0 15	0 00	0 00	0 33	0 00	1 48	0 96	2 12	11 12
1897 . . . . .	5 39	5 58	2 88	0 00	0 00	0 00	0 00	0 00	0 00	1 06	0 00	0 00	15 51
1898 . . . . .	1 42	0 57	0 86	0 10	1 42	0 00	0 17	0 00	0 10	0 25	0 00	0 20	5 09
1899 . . . . .	1 29	0 00	1 45	0 00	T	0 68	0 00	0 00	0 00	1 65	0 82	1 04	6 93
1900 . . . . .	1 31	0 00	1 45	0 25	1 87	0 00	0 00	0 00	T	0 14	6 19	0 00	11 21
Mean (23 years) . . . . .	2 49	2 55	2 69	1 05	0 44	0 12	0 02	0 02	0 04	0 78	1 31	2 69	14 19

## FOLSOM, SACRAMENTO COUNTY

[Elevation, 252 feet ]

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1872 . . . . .	5 50	4 72	1 60	0 63	0 75	T	0 00	T	T	0 25	2 80	6 53	22 78
1873 . . . . .	1 64	4 05	0 34	0 05	0 03	0 00	0 01	T	T	T	1 39	10 51	18 02
1874 . . . . .	5 26	2 63	1 82	2 03	0 61	T	T	0 00	T	1 06	5 19	0 13	19 53
1875 . . . . .	6 14	0 04	1 24	T	0 07	1 23	0 00	0 00	0 00	0 26	7 12	4 49	20 59
1876 . . . . .	5 89	4 06	6 62	1 56	0 24	T	0 26	0 03	0 00	3 76	0 25	0 00	22 67
1877 . . . . .	3 38	0 68	0 81	T	1 02	T	T	T	0 00	0 75	0 54	1 31	8 52
1878 . . . . .	8 41	8 37	4 23	1 10	0 26	0 00	0 00	T	0 12	0 43	0 62	0 56	24 10
1879 . . . . .	4 87	4 94	5 43	3 38	1 44	0 12	0 00	T	0 00	1 21	2 20	3 19	26 78
1880 . . . . .	1 51	2 13	1 40	11 39	2 06	0 00	T	0 00	0 00	T	0 10	9 85	28 14
1881 . . . . .	6 70	6 07	1 38	1 13	T	0 68	0 00	0 00	0 40	1 21	1 57	3 45	22 59
1882 . . . . .	2 38	3 01	3 82	2 51	0 27	0 06	T	0 00	0 68	2 81	3 95	0 74	20 53
1883 . . . . .	2 11	0 80	5 46	1 10	4 57	0 00	0 00	0 00	1 82	1 41	0 81	0 92	19 00
1884 . . . . .	3 88	5 92	8 14	5 32	1 16	1 64	0 00	T	1 64	2 02	0 00	6 13	31 85
1885 . . . . .	1 91	0 84	0 15	1 68	T	0 21	0 02	T	0 21	T	10 91	4 88	20 81
1886 . . . . .	7 60	0 90	3 16	6 78	0 29	0 00	0 00	0 00	0 00	1 34	0 55	3 35	23 97
1887 . . . . .	1 27	9 21	1 30	2 84	0 03	0 22	0 00	T	0 38	0 00	0 59	4 62	20 66
1888 . . . . .	5 83	0 84	3 08	0 12	0 35	0 27	0 02	0 01	0 57	0 00	3 71	4 32	19 12
1889 . . . . .	0 32	0 68	7 07	0 61	2 89	0 23	0 00	0 00	0 00	5 70	4 85	9 41	31 76
1890 . . . . .	7 67	5 26	5 68	2 08	2 66	0 00	0 00	0 00	1 13	0 05	0 00	4 25	28 78
1891 . . . . .	0 60	4 56	5 29	2 22	1 58	0 46	0 10	0 00	0 00	0 20	0 78	4 98	20 77
1892 . . . . .	2 56	3 03	4 17	1 85	3 91	0 07	0 00	T	0 14	1 31	6 82	5 11	28 97
1893 . . . . .	4 42	2 93	6 93	2 00	0 72	0 00	T	0 00	0 43	0 23	3 94	2 50	24 10
1894 . . . . .	5 89	6 40	1 13	0 51	2 81	0 99	0 01	0 03	0 56	2 76	0 89	11 74	33 72
1895 . . . . .	11 24	2 59	2 83	2 05	1 43	0 00	T	T	1 43	0 09	2 06	1 78	25 15
1896 . . . . .	9 11	0 41	4 02	6 44	1 57	0 00	0 00	0 64	0 35	*0 90	6 55	1 77	31 80
1897 . . . . .	4 57	7 95	5 26	0 74	0 51	0 03	0 00	0 09	0 10	2 44	1 02	1 90	24 61
1898 . . . . .	0 83	3 90	0 22	0 54	1 35	0 30	0 00	T	0 24	0 85	1 54	2 47	12 24
1899 . . . . .	4 88	0 07	7 13	0 82	1 17	0 21	0 00	0 06	0 00	5 74	5 45	[4 18]	29 71
1900 . . . . .	4 76	0 91	2 27	2 82	1 66	T	T	0 00	0 28	2 17	3 99	1 67	20 53
Means (29 years) . . . . .	4 52	3 88	3 51	2 22	1 23	0 23	0 01	0 03	0 33	1 36	2 77	4 03	23 61

## GENERAL PRECIPITATION TABLES.

177

## PRECIPITATION OF CALIFORNIA (INCHES AND HUNDREDTHS)—Continued.

## FORT ROSS, SONOMA COUNTY.

[Elevation, 100 feet.]

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1875.....	9.15	0.69	3.41	0.00	0.45	1.90	0.00	0.13	0.00	2.57	12.15	6.33	36.78
1876.....	9.75	9.31	14.44	2.21	1.16	0.23	0.06	0.08	0.71	9.32	0.90	0.15	48.32
1877.....	9.00	5.49	3.95	0.18	0.80	0.78	0.20	0.00	0.00	2.18	5.33	5.22	33.13
1878.....	33.29	29.65	13.85	3.14	0.00	0.00	0.00	0.00	2.09	2.79	2.05	1.31	88.17
1879.....	7.78	11.33	18.43	5.02	2.04	0.00	0.00	0.10	0.00	1.73	15.82	15.47	77.72
1880.....	6.85	3.53	4.05	16.59	3.13	0.00	0.00	0.00	0.00	0.24	0.00	23.38	57.77
1881.....	19.99	13.88	2.97	2.51	0.94	1.83	0.00	0.00	0.75	3.10	0.93	13.06	59.96
1882.....	6.56	11.78	3.01	4.04	0.84	0.13	0.00	0.00	0.57	8.64	5.39	3.49	44.45
1883.....	6.57	1.40	9.67	3.25	6.50	0.00	0.00	0.00	2.00	2.32	0.49	1.38	33.58
1884.....	7.16	7.44	10.76	11.79	0.80	4.40	0.00	0.00	0.80	1.85	1.85	19.17	66.02
1885.....	5.31	3.58	1.45	2.19	0.00	0.33	0.00	0.00	0.55	1.14	18.92	5.98	39.45
1886.....	14.02	0.25	3.56	8.94	2.04	0.00	0.00	0.00	0.00	1.86	0.26	3.12	39.65
1887.....	2.61	8.35	1.72	3.48	0.17	0.12	0.00	0.00	0.60	0.00	2.45	4.11	23.61
1888.....	10.70	2.55	4.61	0.00	0.90	2.49	0.22	0.00	0.58	0.00	4.95	7.71	34.80
1889.....	0.97	1.77	8.35	1.54	3.17	0.20	0.00	0.00	0.12	10.92	4.02	13.07	44.13
1890.....	12.44	3.75	9.87	3.44	1.51	0.13	0.00	0.00	0.19	0.10	0.00	6.21	37.64
1891.....	0.94	12.06	2.11	5.64	1.43	1.07	1.30	0.00	1.47	2.21	2.12	11.70	42.05
1892 <sup>a</sup> .....													
1893.....	7.19	7.89	15.52	5.22	1.01	0.00	0.00	0.00	1.49	0.60	15.07	3.20	62.19
1894.....	18.66	6.70	4.25	2.37	3.01	1.86	0.00	0.00	1.79	4.15	1.40	20.81	65.00
1895.....	28.50	6.02	6.57	2.60	3.84	0.00	1.31	0.00	3.93	0.00	5.34	6.02	64.13
1896.....	24.04	1.38	5.27	6.58	3.64	0.00	0.00	0.20	0.30	3.79	14.65	13.95	73.80
1897.....	4.74	11.49	10.95	0.78	0.86	2.27	0.00	0.00	1.05	4.25	3.45	6.16	46.00
1898.....	2.01	12.94	0.40	0.57	7.61	0.63	0.00	0.00	2.98	1.82	2.74	1.62	33.32
1899.....	20.83	0.85	16.11	0.95	3.32	0.04	0.00	0.00	0.00	5.05	14.74	7.51	70.00
1900.....	8.44	4.39	6.01	5.61	1.35	0.44	0.00	0.00	0.11	7.31	6.00	6.33	45.99
Mean (25 years).....	11.13	7.14	7.25	3.95	2.04	0.75	0.12	0.02	0.88	3.12	5.64	3.66	50.71

## FRUTO, GLENN COUNTY.

[Elevation, 624 feet.]

1889.....	0.82	1.42	6.38	0.92	1.33	0.40	0.00	0.00	0.00	8.81	2.92	10.38	33.38
1890.....	7.58	1.94	3.28	0.81	2.11	0.21	0.00	0.00	0.95	0.00	0.00	3.01	19.89
1891.....	0.43	0.35	0.52	3.42	1.22	0.63	0.00	0.00	0.15	0.00	0.22	4.00	19.94
1892.....	2.00	3.53	2.68	1.89	4.08	0.25	0.00	0.00	0.00	0.50	5.80	6.80	27.53
1893.....	2.70	3.80	6.40	1.00	0.80	0.00	0.00	0.00	0.22	0.00	2.80	1.50	19.22
1894.....	5.35	1.40	0.38	0.50	1.70	0.95	0.00	0.00	0.65	0.80	0.55	9.75	22.03
1895.....	0.90	1.90	1.80	1.25	0.85	0.00	0.05	0.00	1.05	0.00	1.40	1.57	19.77
1896.....	10.93	0.12	0.80	4.40	1.23	0.00	0.00	0.65	1.30	1.15	1.95	6.75	29.23
1897.....	1.95	4.95	1.55	1.10	0.20	1.10	0.00	0.00	0.00	1.03	0.73	0.73	13.39
1898.....	0.55	2.68	0.05	0.60	1.90	0.00	0.00	0.00	0.50	0.50	0.10	1.07	7.95
1899.....	7.48	0.00	3.95	0.75	0.75	0.35	0.00	0.00	0.00	2.10	3.72	2.63	21.78
1900.....	4.20	0.45	1.50	1.70	1.80	0.20	0.00	0.00	0.00	1.90	2.80	2.45	17.00
Mean (12 years).....	4.49	2.63	2.44	1.53	1.50	0.84	T.	0.05	0.40	1.40	1.92	4.23	20.93

<sup>a</sup> Data missing.

## CLIMATOLOGY OF CALIFORNIA.

## PRECIPITATION OF CALIFORNIA (INCHES AND HUNDREDTHS)—Continued

## GALT, SACRAMENTO COUNTY

[Elevation, 49 feet ]

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1878.....	5 62	5 55	3 67	0 89	0 08	0 00	0 00	0 00	0 07	0 27	0 60	0 63	17 38
1879.....	2 74	3 31	3 00	1 42	1 40	0 10	0 00	0 00	0 00	0 80	1 71	2 51	16 99
1880.....	1 12	1 39	1 29	7 31	0 27	0 00	0 00	0 00	0 00	0 00	T	6 35	17 73
1881.....	4 43	2 57	0 50	1 75	0 00	0 33	0 00	0 00	0 24	0 39	0 98	2 39	13 53
1882.....	1 35	1 83	3 77	1 87	0 15	0 00	0 00	0 00	0 05	2 17	2 24	0 25	13 68
1883.....	2 35	0 21	3 15	0 81	4 83	0 00	0 00	0 00	0 62	1 55	0 75	0 85	15 12
1884.....	1 70	4 09	5 46	2 09	0 68	1 36	0 00	0 00	0 00	1 31	0 00	6 06	22 65
1885.....	1 30	0 12	0 00	0 82	0 00	0 00	0 00	0 00	0 00	0 00	5 56	2 33	10 18
1886.....	6 04	0 00	2 69	3 58	0 15	0 00	0 00	0 00	0 00	0 92	0 85	1 76	15 99
1887.....	0 61	5 35	1 11	2 56	0 00	0 00	0 00	0 00	0 15	0 00	0 88	3 27	18 43
1888.....	3 97	0 46	3 14	0 40	0 39	0 00	0 00	0 00	0 92	0 00	3 37	3 14	16 29
1889.....	0 20	0 48	5 36	0 05	2 04	0 08	0 00	0 00	0 00	5 46	3 77	7 64	25 08
1890.....	6 83	3 31	2 76	1 96	1 87	0 00	0 00	0 00	0 83	0 00	0 00	3 08	20 64
1891.....	4 31	4 36	2 78	1 43	0 49	0 00	0 00	0 00	0 00	0 07	0 32	4 32	18.08
1892.....	0 71	1 78	3 76	1 10	3 05	0 00	0 00	0 00	0 10	1 78	5 37	7 96	25 61
1893.....	3 42	2 89	4 49	2 18	0 62	0 00	0 00	0 00	0 16	0 00	3 52	1 49	18 77
1894.....	4 02	5 98	0 66	0 61	3 60	0 63	0 00	0 00	1 32	1 11	0 70	9 29	27 87
1895.....	9 09	3 00	1 66	1 29	0 70	0 00	0 00	0 00	1 05	0 24	1 39	1 47	19 89
1896.....	10.72	0 02	2 69	5 09	0 91	0 00	0 00	0 32	T	0 74	4 24	2 46	27 19
1897.....	2 74	5 87	4 55	0 27	0 27	0 05	0 00	0 00	0 17	1 85	0 49	1 17	17 43
1898.....	0 72	2 18	[0 15]	[0 30]	[0 60]	[0 05]	0 00	0 00	0 20	0 30	1 15	2 35	8 00
1899.....	3.50	0 00	8 00	T	0 30	0 00	0 00	0 00	0 00	4 44	2 90	2 60	21 74
1900.....	2 40	0 50	1 30	1 60	2 20	0 00	0 00	0 00	0 00	1 30	4 22	1 20	14 72
Mean (23 years).....	3.47	2 40	2 87	1 71	1 06	0 11	0 00	0 01	0 26	1 07	1 95	3 23	18 17

## GEORGETOWN, ELDORADO COUNTY

[Elevation, 2,650 feet ]

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1873.....	4 08	13 05	3 05	3 11	0 12	0 00	0 03	0 00	0 00	0 61	0 55	16 60	41 20
1874.....	16 06	8 03	13.87	5 80	1 32	1 20	0 00	0 00	0 00	3 86	14 60	1 24	65 58
1875.....	17 87	0 04	5 07	0 31	2 03	2 06	0 00	0 00	0 00	1 90	24 10	10 85	64 25
1876.....	13 09	9 97	14 54	4 78	1 22	0 00	0 77	0 00	0 00	11 47	0 80	0 00	56 64
1877.....	12 44	2 14	7.78	1 74	3 87	0 24	0 00	0 00	0 00	1 03	4 30	1 97	35 51
1878.....	16 21	22 78	10 92	2 99	0 99	0 12	0 00	0 00	0 66	2 56	2 66	0 48	60 37
1879.....	11 24	12 41	17 57	9 65	3 39	0 34	0 00	0 00	0 00	3 85	6 25	11 73	76 43
1880.....	5 47	6 00	5 50	25 63	5 97	0 00	0 00	0 00	0 00	0 18	0 37	22 67	71.79
1881.....	20 83	12 85	3 84	2 40	0 40	2 28	0 00	0 00	2 02	4 23	3 30	10 32	62 47
1882.....	8.59	5 88	10 44	7 11	2 06	0 18	0 00	0 00	0 16	7 75	7 00	3 31	52 48
1883.....	4 70	3 08	8 73	3 87	7 34	0 00	0 00	0 00	1 60	4 10	1 94	3 50	38 86
1884.....	7 53	13 80	18.94	15 07	1 52	3 65	0 00	0 01	0 80	3 54	0 03	33 73	99 62
1885.....	4 37	0 82	0 24	3 98	0 19	2 28	0 03	0 00	1.16	0 00	20 77	7 03	40 87
1886.....	18 32	1 16	7 75	15 04	1 76	0.06	0 00	0 00	0 00	3 43	1 79	6 90	56 21
1887.....	3 36	15 79	2 40	6 54	0 93	0 18	0 00	0 00	0 58	0 00	1 44	7 66	38 83
1888.....	12.59	2 79	5 47	1 05	0.38	1 56	0 04	0 00	0 41	0 00	4 67	7 99	36 95
1889.....	0 66	0 68	12 29	2 77	7 07	0 25	0 00	0 00	0 00	10 45	9 70	22 94	66 81
1890.....	19 90	8 96	14 70	3 86	4 66	0 10	0 00	0 00	3 00	0 00	0 00	7 65	62 83
1891.....	0 06	10 39	10 00	3 79	2 71	2 22	0 42	0 00	0 17	1 80	1 59	3 74	36 89
1892.....	5 48	8 44	7 90	7 47	7 58	0 38	T	0 00	0 57	3 11	13 31	15 76	70 00
1893.....	8 44	8 20	17 69	6 34	1 51	0 00	T	T	2 06	1 60	10 94	7 19	63 97
1894.....	13 89	16 25	4 74	2 40	5.25	1 61	T	0 20	1.26	6 22	1 53	20 93	74 28
1895.....	20 52	7 69	4 67	4 77	4 30	0 00	0 03	0 07	2 64	0 20	2 18	7 27	54 34
1896.....	19 55	0 77	11 28	16 51	4 81	0 00	0 20	0 10	0 83	1 76	17 18	6 37	79 36
1897.....	4 83	18 26	13 65	2 40	[4 36]	1 00	0 00	0 04	0 30	4 25	4 09	5 57	58 75
1898.....	2 13	8 83	1 80	0 92	2 75	1 23	0 00	T	0 53	2 22	4 34	3 35	28 13
1899.....	8 59	0 61	21 39	1 60	2 32	1 61	0 00	0 14	0 00	9 87	10 33	11 91	68 37
1900.....	5 07	4 29	6 65	5 46	1 88	0 13	0 08	0.00	1 00	5 49	[6 20]	4 16	40 41
Mean (28 years).....	10 23	8 00	9 42	5 98	2 95	0 92	0 09	0 02	0 70	3 41	6 28	9 39	57 22

## GENERAL PRECIPITATION TABLES.

179

## PRECIPITATION OF CALIFORNIA (INCHES AND HUNDREDTHS)—Continued.

## INDIO, RIVERSIDE COUNTY.

[Elevation, -20 feet.]

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1878.....	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.10
1879.....	0.60	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.00	1.30
1880.....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.70	0.70
1881.....	3.45	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.95
1882.....	1.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	2.50
1883.....	0.80	1.13	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.86	2.96
1884.....	0.00	3.16	0.62	0.44	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.70	5.38
1885.....	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.90	0.00	1.00
1886.....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.12
1887.....	0.00	0.93	0.00	0.30	0.00	0.00	0.00	T.	0.05	0.15	0.00	0.00	1.43
1888.....	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.10	1.11	2.96
1889.....	0.57	0.00	1.05	0.00	0.00	0.00	0.00	0.95	0.00	0.60	0.01	3.29	6.47
1890.....	0.65	0.06	0.00	0.00	0.00	0.00	0.00	0.10	0.20	0.00	0.00	0.22	1.23
1891.....	0.00	1.90	0.00	0.00	0.00	0.00	0.00	1.16	0.00	0.00	0.00	0.25	3.31
1892.....	2.00	0.43	0.22	0.04	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.83
1893.....	0.03	0.00	1.60	0.00	0.00	0.00	0.05	0.75	0.07	0.00	0.14	T.	2.64
1894.....	0.00	0.00	0.00	0.00	0.00	0.00	T.	0.00	0.00	0.00	0.00	0.00	T.
1895.....	6.01	0.00	0.00	0.00	0.00	T.	0.00	0.00	0.00	0.00	0.00	0.00	6.01
1896.....	0.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.92
1897.....	1.10	0.19	0.00	0.00	0.00	0.00	0.00	0.00	2.10	0.00	0.00	0.00	3.39
1898.....	0.10	0.00	0.30	0.00	0.00	0.00	0.00	0.30	0.00	0.00	0.00	1.00	1.70
1899.....	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.60	0.20	1.30
1900.....	1.00	0.00	0.30	0.15	T.	0.00	0.00	0.00	0.08	1.04	0.17	0.00	2.74
Mean (23 years).....	0.87	0.35	0.20	0.04	0.03	T.	T.	0.14	0.11	0.08	0.19	0.41	2.43

## IONE, AMADOR COUNTY.

[Elevation, 287 feet.]

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1878.....	5.28	7.02	3.33	1.10	0.19	0.00	0.00	0.00	0.07	0.28	0.91	0.50	18.68
1879.....	2.82	3.76	3.88	2.99	1.00	0.15	0.00	0.00	0.00	1.69	2.84	3.05	22.77
1880.....	1.33	2.39	1.60	7.39	1.00	0.00	0.00	0.00	0.00	T.	0.42	6.68	21.41
1881.....	3.45	3.07	1.34	1.97	0.00	0.33	0.00	0.00	0.10	0.50	1.41	8.54	15.71
1882.....	2.87	2.28	5.10	3.00	0.27	0.04	0.00	0.00	0.06	3.04	0.84	0.25	17.75
1883.....	2.57	0.80	3.57	1.91	3.04	0.00	0.00	0.00	1.14	1.16	1.15	1.70	17.04
1884.....	2.81	6.13	7.87	6.51	0.39	2.03	0.00	0.00	0.20	1.82	0.00	8.22	35.98
1885.....	1.74	0.00	0.10	1.55	0.00	0.43	0.00	0.00	0.00	0.00	8.45	2.17	14.44
1886.....	5.15	0.07	2.40	6.06	0.84	0.00	0.00	0.00	0.00	1.20	0.70	1.64	18.06
1887.....	0.83	7.26	1.55	1.44	0.10	0.00	0.00	0.00	0.67	0.00	0.25	3.17	15.27
1888.....	4.60	0.58	1.16	0.70	0.22	0.00	0.00	0.00	0.96	0.00	2.99	2.48	18.09
1889.....	0.12	0.30	5.33	0.25	2.58	T.	0.00	0.00	0.00	4.71	3.15	6.41	22.85
1890.....	4.94	3.75	4.87	2.50	2.05	0.00	0.00	0.00	0.72	0.00	0.00	3.49	22.32
1891.....	0.40	2.30	4.14	2.11	0.20	0.30	0.00	0.00	0.27	0.45	0.52	4.68	15.32
1892.....	2.00	2.85	4.45	1.40	2.89	0.07	0.00	0.00	0.11	0.18	4.03	6.58	24.51
1893.....	3.30	1.22	5.70	0.23	0.39	0.00	0.00	0.00	0.29	0.13	3.14	1.80	16.20
1894.....	4.44	6.03	0.35	0.51	3.39	0.46	0.00	0.00	0.75	2.08	0.96	8.64	27.61
1895.....	[3.00]	2.49	0.50	3.36	1.88	0.00	0.00	0.00	0.83	0.87	0.42	1.57	14.92
1896.....	5.49	0.14	4.06	3.78	2.89	0.00	0.00	0.00	0.00	0.60	4.58	1.20	22.72
1897.....	2.79	7.10	5.74	0.91	0.42	0.26	0.00	T.	0.13	4.76	1.73	0.98	24.77
1898.....	0.68	3.30	0.12	0.41	1.71	0.00	0.00	0.00	0.51	0.71	1.58	2.66	11.68
1899.....	3.29	0.22	9.00	0.05	0.23	1.78	0.00	0.00	0.00	5.40	3.85	2.42	26.24
1900.....	2.26	0.56	3.00	2.81	1.09	0.12	0.00	0.00	0.20	1.22	5.76	1.50	18.52
Mean (23 years).....	2.88	2.77	3.44	2.30	1.22	0.26	0.00	T.	0.28	1.33	2.16	3.27	19.90

## CLIMATOLOGY OF CALIFORNIA.

## PRECIPITATION OF CALIFORNIA (INCHES AND HUNDREDTHS)—Continued.

## IOWA HILL, PLACER COUNTY

[Elevation 2,825 feet]

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1879	12 50	12 50	18 25	7 87	3 25	0 25	0 00	0 00	0 00	3 50	3 63	13 35	75 10
1880	5 00	6 10	7 88	18 87	6 25	0 00	0 00	0 00	0 00	0 75	0 75	20 80	68 40
1881	20 75	10 50	4 62	3 15	0 13	2 12	0 00	0 00	2 50	4 25	3 90	10 56	62 48
1882	8 92	6 80	10 43	7 59	1 55	0 73	0 00	0 00	0 35	8 50	6 63	2 69	54 19
1883	4 87	4 24	10 63	3 67	7 22	0 00	0 00	0 00	0 75	4 54	2 02	3 75	41 19
1884	8 05	11 26	16 50	13 22	1 60	2 52	0 00	0 00	1 60	2 43	0 00	24 22	81 40
1885	3 03	1 48	0 68	2 93	0 05	1 60	0 00	0 00	1 20	0 00	15 82	6 14	32 93
1886	10 89	0 68	6 46	12 19	1 87	0 00	0 00	T	0 00	2 28	0 80	5 75	40 92
1887	3 61	15 61	2 23	3 55	0 78	0 00	0 00	0 05	0 48	0 00	0 95	6 52	36 78
1888	11 73	2 41	4 59	1 47	1 14	2 60	0 06	T	0 35	0 00	3 78	8 14	36 27
1889	0 58	0 71	12 12	4 20	8 26	0 22	0 00	0 00	0 00	9 20	8 49	21 04	64 82
1890	20 87	10 74	14 12	3 02	3 48	0 08	0 00	T	2 29	0 35	0 00	7 84	62 29
1891	1 96	10 52	8 23	3 55	2 03	2 13	0 83	0 00	0 30	0 98	1 51	11 64	43 73
1892	4 01	5 36	7 11	6 02	6 57	0 41	0 00	0 00	0 51	2 51	8 21	11 88	52 59
1893	6 91	5 80	12 94	6 69	1 44	0 00	T	0 00	1 81	1 35	8 30	5 37	50 61
1894	11 07	12 25	4 20	2 10	4 03	1 64	T	0 51	0 78	4 06	1 48	17 57	59 69
1895	18 64	5 57	4 60	3 93	3 92	0 00	0 03	0 27	2 91	0 17	1 61	5 87	47 52
1896	17 77	0 70	10 93	14 01	4 58	0 00	0 11	0 06	1 00	0 49	18.42	5 13	68 20
1897	3 44	15 83	11 33	2 15	0 15	1 32	0 00	0 00	0 45	3 09	3 49	5 31	46 56
1898	2 04	8 10	1 68	0 99	2 82	1 49	T	0 00	0 44	1 87	4 03	2 84	26 31
1899	6 93	0 83	18 06	1 15	2 41	1 15	0 00	0 32	0 00	9 18	9 08	8 15	57 26
1900	4 43	3 39	6 40	4 59	2 59	0 10	0 05	0 00	0 99	5 67	9 65	3 16	41 02
Mean (22 years)	8 57	6 88	8 82	5 91	3 01	0 88	0 05	0 06	0 88	3 74	4 89	9 42	52 15

## IRVINE, ORANGE COUNTY

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1877	2 14	0 23	1 18	0 60	1 02	0 00	0 00	0 00	0 00	0 00	0.17	4.11	9 45
1878	2 51	6 53	2 49	2 55	1 24	0 00	0 00	0 00	0 00	0 21	0 00	1 35	16.38
1879	1 99	0 82	0 54	0 84	0 00	0 00	0 00	0 00	0 00	0 44	3 67	4 68	12 98
1880	0 93	1 66	1 32	3 88	0 00	0 00	0 00	0 00	0 00	0.55	0 25	4 87	13 46
1881	1 85	0 30	1 27	0 40	0 00	0 00	0 00	0 00	0 00	0 59	0 45	0 13	4 99
1882	1 37	1 91	2 23	0 84	0 22	0 00	0 00	0 00	0 00	0 71	0 90	0 17	8 35
1883	0 85	1 12	1 19	0 56	2 06	0 00	0 00	0 00	0 00	0 91	0 00	2 58	9 27
1884	4 46	12 13	9 33	1 56	1 68	0 00	0 00	0 00	0 00	0 33	0 96	4.97	35 42
1885	0 34	0 00	0 55	2 46	0 00	0 00	0 00	0 00	0 00	0 32	3 09	1 08	7 84
1886	6 37	1 13	2 34	2 05	0 00	0 00	0 00	0 00	0 00	0 10	0 60	0 31	12 90
1887	0 40	5 23	0 32	1 63	0 52	0 00	0 00	0 00	0 00	0 00	1 07	1 78	10 95
1888	5 59	1 11	7 78	0 20	0 00	0 00	0 00	0 00	0 00	0 90	2 28	5 31	23 17
1889	0 45	1 25	4 33	0 30	0 60	0 00	0 00	0 12	0 00	1 39	2 32	11 86	22 62
1890	4 33	1 19	1 00	0 00	0 00	0 00	0 00	0 00	0 54	0 00	0 15	2 44	9 65
1891	0 21	9 34	0 70	0 88	0 50	0 00	0 00	0 00	0 00	0 00	0 00	2 95	14 58
1892	0 99	2 46	2 40	0 70	2 63	0 00	0 00	0 00	0 00	0 17	1 33	1 67	12 35
1893	3 84	2 34	8 37	0 38	0 00	0 00	0 00	0 00	0 00	1 46	0 30	2 27	18 96
1894	0 94	0 43	0 61	0 14	0 27	0 00	0 00	0 00	0 24	0 09	0 00	5 32	8 04
1895	7 08	1 07	2 65	0 47	0 08	0 00	0 00	0 00	0 00	0 00	1 73	0 51	13 59
1896	3 44	3 76	0 00	0 03	0 00	0 00	0 00	0 00	0 00	1 04	1 16	1 74	11 17
1897	3 64	3 92	2 85	0 05	0.11	0 00	0 00	0 00	0 20	1 21	0 07	0 03	12.08
1898	2 07	0 14	0 81	0 44	0 85	0 00	0 00	0 00	0 00	0 00	0 00	0 06	4 37
1899	3 82	0 55	1 35	0 23	T	0 63	0 00	T	0 12	1 14	0 54	0 68	9 06
1900	2 19	T	0 43	1 09	1 07	0 03	0 00	0 00	0 00	0 20	5 14	0 00	10 15
Mean (24 years)	2 58	2 44	2 34	0 93	0 54	0 03	0 00	T	0 05	0 49	1 09	2 54	13 01



## PRECIPITATION OF CALIFORNIA (INCHES AND HUNDREDTHS)—Continued.

## KERLER, INYO COUNTY.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1885.....	0.00	0.00	0.12	0.82	0.00	0.08	0.00	0.11	0.00	0.25	0.65	0.86	2.39
1886.....	0.49	0.14	0.60	0.40	0.00	0.00	0.14	0.08	0.00	0.01	0.08	0.00	1.94
1887.....	T.	0.93	0.00	1.14	0.04	T.	0.52	0.00	1.08	0.84	0.01	0.48	5.04
1888.....	0.70	1.21	0.80	0.12	0.30	0.20	0.17	0.10	0.06	0.00	1.68	0.82	5.66
1889.....	0.04	T.	0.52	0.12	0.06	0.01	0.00	T.	0.08	0.56	0.05	0.56	2.00
1890.....	0.42	0.01	T.	0.10	0.20	0.00	0.00	1.30	0.40	0.08	0.12	0.16	3.74
1891.....	0.00	0.98	0.16	0.10	0.37	0.30	0.06	0.02	0.19	0.04	0.00	0.31	2.53
1892.....	0.26	0.19	0.32	0.00	0.56	T.	0.00	T.	T.	0.81	0.11	0.54	2.79
1893.....	0.71	0.73	0.84	T.	T.	0.00	0.41	T.	T.	T.	0.12	0.78	3.59
1894 <sup>a</sup> .....	T.	0.29	0.01	T.	T.	T.	0.11	0.00	0.00	0.00	0.00	1.05	1.46
1895.....	0.35	1.15	T.	0.25	T.	T.	T.	T.	T.	0.00	0.00	T.	1.75
1896.....	0.45	0.00	T.	T.	0.15	T.	0.25	1.42	0.50	T.	0.00	0.25	3.02
1897.....	0.10	0.27	0.13	0.00	T.	0.00	0.00	0.19	0.14	0.15	T.	T.	0.98
1898.....	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	T.	0.00	T.	0.30	0.85
1899.....	0.40	[0.45]	0.00	0.01	T.	0.50	T.	T.	0.00	T.	1.75	T.	3.21
1900.....	T.	0.00	0.16	1.25	0.23	T.	0.10	T.	0.35	0.09	0.45	0.00	2.63
Mean (16 years).....	0.25	0.38	0.20	0.27	0.12	0.07	0.11	0.20	0.18	0.17	0.31	0.35	2.76

<sup>a</sup>Southern Pacific Railway Company.

## KENNEDY GOLD MINE, AMADOR COUNTY.

1892.....	2.25	4.61	6.60	3.63	4.94	0.73	0.00	0.00	0.38	1.76	7.38	6.99	39.27
1893.....	5.81	4.91	12.04	3.10	1.23	0.00	0.00	0.00	1.05	T.	5.98	4.81	38.93
1894.....	9.31	11.86	2.23	1.48	5.64	1.89	0.00	0.00	1.30	3.69	1.40	16.44	55.25
1895.....	13.11	5.39	4.48	5.08	3.18	0.00	0.00	0.00	1.71	0.19	0.90	3.62	37.66
1896.....	11.80	0.80	4.80	11.20	2.27	0.00	0.25	T.	0.29	1.17	10.71	4.55	47.84
1897.....	6.00	13.06	7.02	1.51	0.45	1.06	0.00	0.15	0.37	3.68	2.50	3.26	39.06
1898.....	1.71	6.05	0.88	1.18	2.34	0.80	0.00	0.00	0.42	1.13	2.99	3.19	20.19
1899.....	4.43	0.53	12.54	1.53	2.33	0.21	0.40	0.04	0.02	0.85	6.11	6.41	42.27
1900.....	2.90	1.97	4.89	4.44	1.89	0.18	0.00	0.00	0.35	2.70	8.75	2.53	30.00
Mean (9 years).....	6.37	5.46	6.16	3.63	2.70	0.48	0.07	0.02	0.65	1.57	5.75	5.76	39.01

## KING CITY, MONTEREY COUNTY.

[Elevation, 333 feet.]

1887.....	0.38	5.08	0.18	0.58	0.02	0.09	0.00	0.00	0.06	0.05	0.81	1.99	8.74
1888.....	2.85	0.70	2.76	0.10	0.01	0.00	0.00	0.00	0.72	0.00	3.73	2.52	13.37
1889.....	0.92	1.33	6.13	0.29	0.48	0.00	0.00	0.00	0.00	4.17	2.74	8.07	24.13
1890.....	4.34	3.01	1.13	0.00	0.13	0.00	0.00	0.00	0.97	0.00	0.12	1.54	11.24
1891.....	0.40	4.77	0.52	0.76	0.00	0.00	0.00	0.00	0.00	0.00	0.02	2.40	8.87
1892.....	0.66	1.27	2.08	0.26	1.08	0.00	0.00	0.00	0.00	0.42	2.78	4.78	13.33
1893.....	1.75	1.63	3.17	0.88	0.27	0.00	0.00	0.00	T.	0.00	0.18	1.30	9.13
1894.....	1.47	0.06	0.30	0.06	0.66	0.18	0.00	0.00	1.13	0.41	0.25	4.15	9.27
1895.....	3.89	0.35	1.51	0.40	0.13	0.00	0.00	0.00	0.05	1.46	0.51	0.49	8.79
1896.....	4.53	0.00	1.73	1.84	0.04	0.00	0.00	T.	0.00	0.50	1.92	1.46	12.08
1897.....	2.07	1.20	2.20	0.11	0.00	0.07	0.00	0.07	0.00	0.73	0.18	0.32	6.95
1898.....	0.54	1.30	0.54	0.05	0.24	0.00	0.00	0.00	0.00	0.00	0.22	0.27	.....
1899.....	3.00	0.18	2.04	1.10	0.13	0.07	0.00	0.00	0.00	1.73	1.15	1.21	10.67
1900.....	1.89	0.06	0.85	0.82	0.86	0.00	0.00	0.00	0.00	1.52	6.33	0.17	12.50
Mean (14 years).....	2.05	1.54	1.80	0.52	0.29	0.03	0.00	T.	0.21	0.79	1.46	2.19	10.65

## CLIMATOLOGY OF CALIFORNIA.

## PRECIPITATION OF CALIFORNIA (INCHES AND HUNDREDTHS)—Continued

## KNIGHTS LANDING, SUTTER COUNTY

[Elevation, 45 feet ]

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1878.....	3 49	5 64	2 30	1 48	0 25	0 00	0 00	0 00	0 16	0 24	0 71	0 10	14 37
1879.....	2 39	2 86	3 42	2 88	1 07	0 16	0 00	0 05	0 00	0 21	1 77	3 93	18 69
1880.....	1 25	1 25	0 76	6 64	0 40	0 00	0 00	0 00	0 00	0 00	0 00	6 99	17 29
1881.....	4 22	2 87	1 11	1 23	0 25	0 89	0 00	0 00	0 42	0 33	2 04	2 17	13 53
1882.....	1 30	1 75	2 19	1 33	0 16	0 16	0 00	0 00	0 71	1 51	2 58	0 34	12 03
1883.....	1 46	0 66	3 11	0 87	3 32	0 00	0 00	0 00	0 00	1 50	0 54	0 45	11.93
1884.....	3 68	3 53	4 88	3 15	0 00	1 89	0 00	0 00	0 35	1 45	0 00	5 56	24 49
1885.....	1 42	0 00	0 48	1 59	0 00	0 00	0 00	0 00	0 00	0 00	8 00	4 93	16 42
1886.....	5 53	0 00	1 37	4 25	0 00	0 00	0 00	0 00	0 00	0 23	0 00	1 60	12 98
1887.....	1 00	6 60	0 75	2 30	0 00	0 00	0 00	0 00	0 00	0 00	0 57	3 26	14 48
1888.....	4 18	0 91	2 51	0 07	0 43	0 34	0 02	0 00	0 81	0 00	5 72	4 82	19 81
1889.....	2 84	0 28	6 53	0 42	2 17	0 41	0 00	0 00	0 00	5 28	3 93	8 78	30 64
1890.....	4 80	4 18	3 37	1 02	1 93	0 00	0 00	0 00	0 40	0 00	0 00	2.37	18 07
1891.....	0 53	9 40	0 00	2 16	0 00	0 00	0 00	0 00	0 00	0 00	0 35	2 64	15 08
1892.....	1 75	2 38	2 57	0 91	2 44	0 00	0 00	0 00	0 00	0 59	5 38	5 70	21 72
1893.....	3 21	2 63	3 60	0 75	0 98	0 00	0 00	0 00	0 15	0 08	1 77	1 72	14 89
1894.....	3 42	1 64	1 24	0 32	1 91	0 49	0 00	0 00	1 10	1 02	0 70	12 52	24 36
1895.....	3 73	1 29	1 03	0 57	0 95	0 00	0 00	0 00	2 15	0 00	2 01	3 90	20 63
1896.....	11 65	0 21	2 25	5 99	0 95	0 00	0 00	0 00	0 64	1 22	4 05	2 34	29 30
1897.....	2 97	5 05	1 89	0 25	1 50	0 30	0 00	0 00	0 10	2 05	0 80	3 90	18 81
1898.....	0 49	3 46	2 27	0 34	1 43	0 00	0 00	0 00	0 36	0 88	0 66	1 44	11 33
1899.....	4 87	0 00	2 47	0 15	0 62	0 88	0 00	T	0 00	5 00	3 39	3.78	23 16
1900.....	3 14	0 17	1 88	1 36	0 88	T	0 00	0 00	T	1 68	5 20	0.97	15 28
Mean (23 years).....	3 41	2 47	2 26	1 74	0 94	0 24	T	T	0 32	1 01	2 18	3 66	18 32

## KONO TAYEE, LAKE COUNTY

[Elevation, 1,325 feet ]

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1874.....	1 88	3 60	4 62	2 05	0 45	0 00	0 00	0 00	0 00	3 70	6 25	0 29	22 84
1875.....	9 16	0 38	0 92	0 00	0 84	0 42	0 00	0 00	0 00	1 17	6 96	5.12	24 97
1876.....	6 05	4 22	8 34	0 10	0 00	0 00	0 00	0 00	0 00	0.20	3 50	0 00	22 41
1877.....	3 17	2 81	1 40	0 50	0 00	0 50	0 00	0 00	0 73	1 65	2 23	1 98	14 97
1878.....	14 16	11 04	4 60	[1 36]	[0 70]	[0 53]	0 00	0.07	0 00	0 41	1 37	0 33	34 57
1879.....	3 01	3 41	9 15	0 47	0 64	0 00	0 00	0 05	0 00	0 91	3 57	5 72	26 93
1880.....	6 24	3 85	4 74	0 48	0 25	0 00	0 00	0 00	0 00	0 00	3 54	1 92	21.02
1881.....	5 50	6 58	0 64	0 95	0 12	0 25	0 00	0 00	0 00	0 63	2 90	1 77	19 34
1882.....	1 74	3 20	2 34	1 54	0 40	0 00	0 00	0 00	0 42	1 64	4 42	0 98	16.68
1883.....	1 40	0 60	3 81	0 95	2 41	0 00	0 00	0 00	0 70	0 99	0 39	0 70	11 95
1884.....	4 17	1 91	5 35	3 88	0 06	4 08	0 00	0 00	0.00	.....	.....	.....	.....
1892.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.84	6 53	5 57	32 39
1893.....	3 84	4 15	5 41	2 06	0 66	0 00	0 00	0 00	0 25	0 42	3 76	2 34	22 89
1894.....	6 92	4 32	1 11	0 91	0 90	1 64	0 00	T	0 50	1 22	0 74	10 70	28 96
1895.....	14 45	2 32	3 13	0 98	1 14	0 00	0 00	T	0 71	0 00	1 69	2 12	26 54
1896.....	9 42	0 25	2 31	4 62	1 69	[0 53]	T	0 27	0 29	0 73	3 33	5 93	29.37
1897.....	2 85	4 01	3 76	0 90	0 90	0 48	0 00	0 00	0 00	1 24	1 64	2 12	17.90
1898.....	0 71	4 19	0 11	0 64	1 67	[0 53]	0 00	0 00	0 51	0 46	1.15	1 27	11 24
1899.....	7 74	T	5 43	0 70	0 45	0 28	0 18	T	0 00	3 78	5 56	4 14	28 26
1900.....	3 10	1 27	2 89	2 32	0 67	T	0 00	0 00	T	3 11	3 89	1 67	18 92
Mean (19 years).....	5 55	3 27	3 69	1 34	0 73	0 49	0 01	0 02	0 22	1 22	3 34	2 97	22 74

## GENERAL PRECIPITATION TABLES.

183

## PRECIPITATION OF CALIFORNIA (INCHES AND HUNDREDTHS)—Continued.

## LAGRANGE, STANISLAUS COUNTY.

[Elevation, 298 feet.]

Year.	Jan.	Feb.	Mar.	Apr.	May	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1868.....	3.84	3.63	4.67	1.57	1.32	0.00	0.00	0.00	0.00	0.30	0.20	3.25	18.78
1869.....	4.00	5.13	3.07	1.06	1.15	0.00	0.00	0.00	0.00	1.56	0.69	0.69	17.35
1870.....	1.87	4.32	1.43	1.85	0.43	0.00	0.00	0.00	0.00	0.50	0.25	2.10	12.75
1871.....	2.19	2.13	0.31	2.55	0.43	0.00	0.00	0.00	0.00	0.00	2.25	6.94	16.80
1872.....	2.69	5.32	2.18	0.80	0.30	0.00	0.00	0.00	0.00	0.00	0.12	7.69	19.10
1873.....	1.12	4.67	0.60	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.14	4.19	10.87
1874.....	3.92	2.32	2.91	1.15	0.00	0.00	0.00	0.00	0.15	3.52	3.54	0.11	17.62
1875.....	2.30	0.00	0.41	0.26	0.00	0.00	0.00	0.00	0.00	0.40	10.58	1.98	15.98
1876.....	5.63	2.25	3.88	0.67	0.48	0.00	0.00	0.00	0.00	0.55	0.48	0.00	18.94
1877.....	2.59	0.45	0.61	0.00	1.06	0.00	0.00	0.00	0.00	0.68	1.18	1.12	7.69
1878.....	5.58	5.54	3.09	1.67	0.04	0.00	0.00	0.00	0.05	0.90	0.50	0.20	17.57
1879.....	1.91	2.39	2.16	2.30	0.98	0.15	0.00	0.00	2.35	1.61	2.48	0.60	16.98
1880.....	2.68	1.70	6.04	2.04	0.00	0.00	0.00	0.00	0.16	0.92	4.21	4.58	22.83
1881.....	3.52	1.09	0.60	0.04	0.00	0.00	0.00	0.00	0.75	0.60	1.13	1.96	9.69
1882.....	1.10	1.67	4.72	2.25	0.33	0.00	0.00	0.00	0.51	1.54	1.33	0.51	13.96
1883.....	2.93	1.35	3.58	1.33	2.90	0.00	0.00	0.00	0.55	1.20	0.84	0.70	15.38
1884.....	2.85	6.07	6.06	4.90	0.79	1.05	0.00	0.00	0.95	1.85	0.02	6.77	31.31
1885.....	0.88	0.03	0.17	1.19	0.00	0.03	0.00	0.00	0.00	10.60	1.43	1.48	14.38
1886.....	3.79	0.32	3.24	4.56	0.10	0.00	0.00	0.00	0.00	0.22	1.20	0.75	14.18
1887.....	0.51	5.11	0.40	2.82	0.00	0.00	0.00	T.	0.37	T.	0.20	4.02	18.43
1888.....	2.84	0.66	2.03	0.17	0.52	T.	0.02	T.	0.32	0.00	3.20	3.67	14.12
1889.....	0.17	0.61	4.24	0.58	1.64	T.	0.00	T.	0.17	4.00	4.59	7.64	23.64
1890.....	5.17	3.77	2.13	1.45	1.42	0.00	T.	T.	0.95	T.	0.18	2.83	17.90
1892.....	0.50	5.25	1.19	1.48	3.04	0.00	0.00	0.00	0.06	0.70	5.46	2.88	20.56
1893.....	1.93	2.42	5.12	0.75	0.05	0.00	0.00	T.	0.57	0.12	1.70	2.82	15.48
1894.....	0.17	6.43	0.61	0.30	3.39	0.66	T.	T.	0.67	0.85	0.60	7.60	27.23
1895.....	5.17	2.00	2.50	1.40	0.97	0.00	0.00	0.00	0.20	0.54	0.72	1.56	15.65
1896.....	4.72	0.20	2.65	3.25	0.45	T.	0.10	0.33	T.	1.50	3.73	1.94	18.87
1897.....	2.20	6.07	3.84	T.	T.	0.52	0.00	0.00	T.	1.97	0.68	1.38	16.66
1898.....	0.99	1.92	1.87	0.35	1.41	0.00	0.00	0.00	0.70	0.55	0.86	1.40	10.05
1899.....	2.51	0.35	5.04	0.35	0.90	0.15	0.00	0.02	0.00	2.60	4.25	1.79	17.96
Mean (81 years).....	2.85	2.77	2.64	1.41	0.78	0.08	T.	0.01	0.31	0.94	2.19	2.75	16.71

## LA PORTE, PLUMAS COUNTY.

[Elevation, 5,000 feet.]

1894.....	[15.75]	[10.11]	[9.36]	3.05	2.00	3.49	T.	0.17	1.13	8.87	1.32	15.47	70.72
1895.....	22.01	6.65	6.12	4.00	8.55	0.00	1.41	0.29	3.42	0.69	3.35	9.98	71.47
1896.....	32.43	2.84	16.20	16.63	9.32	0.09	0.31	0.25	2.29	3.09	23.87	12.88	120.20
1897.....	6.01	17.92	13.51	3.12	0.71	3.94	0.00	T.	1.26	4.84	9.34	6.68	67.31
1898.....	2.53	13.04	1.62	1.49	4.64	2.73	T.	0.04	0.94	3.31	6.67	3.86	40.37
1899.....	12.95	2.69	25.26	2.92	4.43	1.43	0.00	0.32	0.00	13.30	15.96	16.23	101.04
1900.....	11.95	5.66	12.24	6.51	2.57	0.36	0.06	T.	0.61	13.02	13.70	8.79	75.47
Mean (7 years).....	14.81	8.42	12.04	5.39	4.60	1.73	0.25	0.22	2.10	7.45	10.60	10.43	78.08

## CLIMATOLOGY OF CALIFORNIA.

## PRECIPITATION OF CALIFORNIA (INCHES AND HUNDREDTHS)—Continued

## LODI, SAN JOAQUIN COUNTY

[Elevation, 35 feet]

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1888	5 09	0 44	2 59	0 11	0 61	0 43	0 00	0 00	0 88	0 00	3 61	3 56	17 32
1889	0 35	0 65	5 07	0 20	2 57	0 11	0 00	0 00	0 00	5 62	4 71	7 70	26 98
1890	6 67	2 90	2 71	1 94	1 20	0 00	0 00	0 00	0 99	0 00	0 00	3 65	20 06
1891	0 44	5 03	3 52	2 45	0 34	0 14	0 00	0 00	0 16	0 18	0 49	4 69	17 44
1892	1 04	1 81	4 04	1 78	2 47	0 25	0 00	0 00	0 25	1 83	5 47	5 42	24 36
1893	3 42	2 66	3 88	2 04	0 92	0 00	0 00	0 00	0 15	T	3 11	1 91	18 09
1894	3 99	6 75	0 57	0 44	3 33	1 19	T	T	1 78	2 14	0 73	9 27	30 19
1895	7 46	2 35	1 45	1 24	0 63	0 00	0 00	T	0 88	0 13	1 24	1 50	16 88
1896	9 02	0 21	2 32	2 90	0 82	0 00	T	0 17	0 04	1 19	3 86	1 87	22 40
1897	3 41	4 29	3 88	0 40	0 10	0 04	0 04	T	0 16	1 29	0 66	1 57	15 84
1898	1 05	1 71	0 98	0 40	1 38	0 06	0 00	0 00	0 60	0 45	0 66	1 93	9 22
1899	3 42	0 16	6 81	0 30	0 65	0 31	0 00	0 39	0 00	3 74	3 01	2 18	20 87
1900	2 92	0 37	1 45	2 26	2 72	T	T	0 00	0 12	1 83	4 87	1 06	17 00
Mean (13 years)	3 71	2 26	3 02	1 27	1 36	0 20	T	0 04	0 46	1 42	2 49	3 56	19 80

## LOS BANOS, MERCED COUNTY

[Elevation, 121 feet]

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1873	1 79	1 18	1 32	0 84	0 37	0 14	0 02	T	0 04	0 23	1 46	0 74	8 13
1874	1 61	1 08	1 20	0 77	0 28	0 13	0 05	0 00	0 00	0 29	0 99	1 37	7 72
1875	3 72	0 00	0 33	0 57	T	0 09	0 25	0 00	0 00	0 00	5 06	0 42	10 44
1876	1 50	1 54	1 60	0 11	0 00	0 00	0 00	0 00	0 00	0 03	0 16	0 00	4 94
1877	0 96	0 25	0 16	T	0 04	0 00	0 00	0 00	0 00	0 00	0 79	0 65	2 85
1878	2 56	3 14	1 19	0 59	0 00	0 00	0 00	0 00	0 00	0 27	0 19	0 29	8 28
1879	0 50	0 89	0 42	0 68	0 17	0 08	0 00	0 00	0 00	0 14	0 67	0 79	4 34
1880	0 23	0 83	0 29	1 65	0 31	0 00	0 00	0 00	0 00	0 00	0 58	3 42	7 31
1881	0 99	1 16	0 86	0 99	0 00	0 00	0 00	0 00	0 00	0 00	0 30	0 20	4 50
1882	0 71	0 49	2 26	0 35	0 00	0 00	0 00	0 00	0 44	0 70	0 57	0 07	5 59
1883	1 62	0 43	1 81	0 07	1 81	0 00	0 00	0 00	0 00	0 42	0 06	0 38	6 60
1884	1 42	3 09	2 95	1 80	1 03	1 37	0 00	0 00	0 00	1 01	0 05	3 96	16 74
1885	0 85	0 05	0 65	0 75	0 00	0 00	0 00	T	0 00	0 00	6 24	0 69	9 23
1886	3 32	0 05	1 32	1 46	0 00	0 00	0 00	0 00	0 00	0 42	0 18	0 21	6 96
1887	0 06	1 50	0 44	0 43	0 00	T	0 00	0 00	T	0 00	0 05	0 74	3 22
1888	1 83	0 06	1 33	0 00	0 19	T	T	T	0 60	0 00	2 99	1 02	8 02
1889	0 27	0 76	1 77	0 22	0 64	T	0 00	0 00	0 14	0 86	2 43	5 54	12 63
1890	3 11	1 03	0 75	0 02	0 33	0 00	0 00	0 02	1 24	0 00	0 16	1 32	7 98
1891	0 07	2 17	0 39	1 64	0 00	0 00	0 00	0 00	0 20	0 12	0 12	3 05	7 76
1892	0 10	1 07	1 75	0 85	0 90	0 00	0 00	0 00	0 00	0 21	0 71	2 64	8 27
1893	0 75	2 20	2 19	0 19	0 11	0 00	0 00	0 00	0 05	0 05	0 30	0 97	6 81
1894	1 80	1 50	0 00	0 00	1 06	0 56	0 00	0 00	0 75	0 46	0 13	4 08	10 34
1895	3 17	0 95	1 22	0 38	0 35	0 00	0 00	0 00	0 00	0 20	0 45	1 00	7 72
1896	4 34	0 00	0 57	0 55	0 40	0 00	0 15	0 00	0 00	0 91	1 06	0 53	8 51
1897	1 08	1 78	1 20	0 00	0 00	0 00	0 00	0 08	0 00	0 80	T	0 00	4 94
1898	1 53	0 54	0 72	0 00	0 66	0 00	0 00	0 00	0 10	0 32	0 05	0 05	4 57
1899	1 62	0 00	2 00	1 15	0 00	0 00	0 00	0 00	0 00	2 11	0 95	0 88	8 71
1900	1 18	0 00	0 33	1 10	2 20	0 00	0 00	0 00	0 00	0 35	3 75	0 55	9 51
Mean (28 years)	1 52	0 99	1 11	0 61	0 39	0 08	0 02	T	0 13	0 28	1 09	1 32	7 62

## PRECIPITATION OF CALIFORNIA (INCHES AND HUNDREDTHS)—Continued.

## MANZANA, LOS ANGELES COUNTY.

[Elevation, 2,870 feet.]

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1894.....	0.21	0.37	0.36	T.	0.35	0.17	0.00	0.10	0.49	0.00	0.00	3.60	5.65
1895.....	2.79	0.00	1.36	0.08	T.	0.00	0.00	0.00	0.00	0.40	0.48	0.18	5.29
1896.....	1.09	0.00	1.70	0.63	T.	0.00	T.	1.04	0.00	0.61	0.30	1.46	6.83
1897.....	2.70	3.04	1.71	0.04	0.01	T.	T.	0.28	0.00	0.21	T.	0.14	8.13
1898.....	1.70	0.02	0.47	0.00	0.25	0.00	0.00	0.00	T.	0.00	T.	0.50	2.94
1899.....	1.15	T.	1.35	0.04	0.09	0.04	0.00	0.00	0.00	1.27	0.71	0.29	4.94
1900.....	1.11	0.10	0.93	0.42	0.38	0.00	0.00	0.08	0.10	0.09	2.55	0.00	5.76
Mean (7 years).....	1.54	0.50	1.13	0.17	0.15	0.03	T.	0.21	0.08	0.37	0.58	0.88	5.65

## MARYSVILLE, YUBA COUNTY.

[Elevation, 67 feet.]

1871.....	[3.22]	1.21	0.29	0.53	1.00	0.00	0.00	0.00	0.00	0.09	0.72	3.03	15.14
1872.....	5.50	3.88	2.27	1.03	0.00	0.00	0.00	0.00	0.00	0.00	0.08	4.90	17.66
1873.....	1.75	4.30	1.04	0.71	0.32	0.00	T.	0.00	0.00	0.58	2.39	12.37	23.46
1874.....	5.55	1.63	3.79	1.13	0.30	0.00	0.00	0.00	0.00	1.72	4.14	0.34	18.60
1875.....	4.21	0.04	1.20	0.00	0.06	1.97	0.00	0.00	0.00	0.02	3.56	2.41	18.47
1876.....	2.79	3.32	4.06	1.05	0.15	0.00	0.11	0.06	0.00	4.15	0.40	0.00	16.09
1877.....	3.60	1.57	0.92	0.12	0.31	0.42	0.00	0.00	0.00	0.50	1.63	1.55	11.17
1878.....	9.47	5.32	3.53	1.30	0.39	0.00	0.00	0.00	0.62	0.64	0.60	0.49	22.36
1879.....	1.76	2.93	3.08	3.76	1.79	0.09	0.00	0.03	0.00	1.04	2.33	3.60	20.91
1880.....	1.27	1.28	0.66	7.23	0.99	0.00	0.00	0.00	0.00	0.00	0.05	6.90	18.38
1881.....	4.33	3.90	0.83	1.07	T.	0.35	0.00	0.00	0.60	1.82	0.93	2.68	16.51
1882.....	1.84	2.51	1.93	1.09	0.00	0.98	0.00	0.00	1.00	2.40	1.57	0.77	15.09
1883.....	1.55	0.40	2.76	0.30	3.50	0.00	0.00	0.00	1.15	0.75	0.61	0.40	11.42
1884.....	2.49	2.82	3.31	2.57	0.00	1.18	0.00	0.00	0.09	1.74	0.00	4.24	18.44
1885.....	1.32	0.07	0.12	0.42	0.00	0.15	0.00	T.	0.00	0.15	8.23	3.95	14.41
1886.....	3.96	0.34	1.45	3.96	0.23	0.00	0.00	0.00	0.00	0.63	T.	2.30	12.87
1887.....	0.73	6.09	1.02	1.90	0.10	0.09	0.00	0.00	0.00	0.00	1.07	3.70	14.70
1888.....	4.53	1.65	2.55	0.00	0.41	0.32	0.00	0.00	0.00	0.00	4.23	6.27	20.01
1889.....	1.05	0.35	7.53	1.00	2.35	0.50	0.00	0.00	0.03	5.87	3.73	9.01	31.39
1890.....	4.44	4.65	6.71	1.85	2.55	0.10	0.00	0.00	0.73	0.00	0.00	2.62	23.65
1891.....	0.54	8.68	0.86	1.52	0.67	0.10	0.00	0.00	0.00	0.00	0.70	3.77	16.84
1892.....	2.32	3.77	3.63	1.86	2.94	0.00	0.00	0.00	0.20	1.20	6.90	3.66	26.43
1893.....	1.80	3.39	3.68	1.00	1.10	0.00	0.00	0.00	0.00	0.84	2.23	1.92	15.46
1894.....	0.34	1.74	0.73	0.47	1.86	0.64	0.00	0.00	0.62	1.91	0.80	9.13	18.24
1895.....	7.56	[2.85]	[2.26]	1.04	0.37	0.00	0.00	0.00	2.33	0.04	0.83	1.02	18.34
1896.....	8.32	0.17	1.24	4.96	0.70	0.00	0.00	T.	0.77	0.61	2.66	2.07	21.50
1897.....	2.22	5.80	1.75	1.53	0.36	T.	0.00	0.00	0.00	1.80	0.85	1.60	15.71
1898.....	1.45	5.06	0.00	0.44	1.74	0.00	0.00	0.00	0.35	0.90	1.28	1.61	12.61
1899.....	4.22	0.00	6.30	0.55	0.09	1.25	0.00	0.26	0.00	4.20	6.26	3.14	26.27
1900.....	8.59	0.43	1.03	2.45	1.02	0.04	0.03	0.00	0.60	2.13	4.97	1.85	23.16
Mean (30 years) ..	3.43	2.67	2.37	1.56	0.86	0.27	T.	0.01	0.28	1.17	2.13	3.54	18.35

## MENDOTA, FRESNO COUNTY.

[Elevation, 177 feet.]

1894.....	[1.39]	0.86	0.00	0.10	0.47	0.49	0.00	0.00	0.33	0.09	0.00	3.65	7.93
1895.....	1.20	0.51	1.07	0.46	0.60	0.00	0.00	0.00	0.16	1.04	0.40	0.00	5.44
1896.....	2.56	0.00	0.44	0.51	0.20	0.00	0.13	0.00	0.07	0.49	1.21	0.50	6.11
1897.....	1.21	0.67	0.86	0.07	0.00	T.	0.00	0.00	0.00	0.68	0.22	0.08	3.79
1898.....	0.59	1.49	0.54	0.00	0.55	0.00	0.00	0.00	0.11	0.12	0.00	1.85	5.05
1899.....	0.76	0.00	1.10	0.10	0.35	0.00	0.00	0.00	0.00	1.57	1.36	0.36	5.60
1900.....	0.70	0.00	0.64	0.66	0.59	0.00	0.00	0.00	0.00	0.52	3.89	0.44	7.44
Mean (7 years) ..	1.20	0.50	0.66	0.27	0.39	0.07	0.02	0.00	0.17	0.64	1.01	0.95	5.91

## CLIMATOLOGY OF CALIFORNIA.

## PRECIPITATION OF CALIFORNIA (INCHES AND HUNDREDTHS)—Continued

## MERCED, MERCED COUNTY.

[Elevation, 173 feet]

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1872.....	2 16	1 62	0 36	0 89	0 00	0 00	0 00	0 00	0 00	0 00	T	5 30	10 33
1873.....	5 69	1 22	T	0 00	0 00	0 00	T	0 00	0 00	0 00	1 42	1 67	10 00
1874.....	2 20	0 00	0 00	0 00	1 65	0 00	0 00	0 00	0 47	1 84	1 60	0 00	7 76
1875.....	3 95	0 15	0 97	0 00	0 00	1 02	0 00	0 00	0 00	0 00	5 83	0 73	12 65
1876.....	2 90	1 38	1 54	0 17	0 13	0 00	0 17	0 00	0 00	0 72	0 09	0 00	7 10
1877.....	1 14	0 03	0 53	T	0 52	0 00	0 00	0 00	0 00	0 06	1 17	0 85	4 30
1878.....	3 35	2 78	1 89	1 71	T	0 00	0 00	0 00	0 00	0 25	0 42	0 03	10 43
1879.....	0 96	1 32	1 19	1 35	0 21	0 10	0 00	0 00	0 00	0 60	1 63	1 08	8 44
1880.....	0 69	2 06	0 64	4 71	0 48	0 00	0 00	0 00	0 00	0 00	0 63	4 60	13 81
1881.....	3 40	1 69	0 85	0 34	0 00	0 08	0 00	0 00	0 14	0 35	0 47	0 70	8 02
1882.....	0 92	1 37	3 19	1 12	0 32	0 00	0 00	0 00	0 53	0 98	0 53	0 07	9 03
1883.....	1 55	0 50	3 11	0 41	2 13	0 00	0 00	0 00	0 10	1 01	0 38	0 99	10 18
1884.....	1 64	4 39	5 38	5 60	0 86	1 73	0 00	0 00	0 00	0 54	0 02	3 63	23 79
1885.....	0 85	0 00	0 65	1 49	0 00	0 00	0 00	0 00	0 00	0 00	5 82	1 08	9 89
1886.....	2 64	0 10	0 94	2 85	0 00	0 00	0 00	0 00	0 00	0 47	0 25	0 58	7 83
1887.....	0 13	2 83	0 20	1 74	0 00	0 00	0 00	0 00	0 45	0 00	0 10	1 00	6 45
1888.....	2 67	0 15	1 68	0 28	0 65	0 10	0 00	0 00	0 50	0 00	2 40	2 12	10 55
1889.....	0 45	0 15	1 21	0 20	0 77	0 00	0 00	0 00	0 00	1 61	2 80	5 59	12 78
1890.....	4 40	1 50	1 01	0 39	0 51	0 00	0 00	0 00	1 73	0 00	0 00	[2 00]	11 54
1891.....	0 33	2 23	1 29	1 05	0 05	0 24	0 00	0 00	0 00	0 20	0 18	2 99	8 56
1892.....	0 31	0 79	1 85	0 85	2 47	0 00	0 00	0 00	0 10	0 27	0 64	2 75	10 03
1893.....	1 05	2 31	3 49	0 37	0 00	0 00	0 00	0 00	0 07	0 00	0 65	1 13	9 07
1894.....	2 68	3 28	0 21	0 29	2 02	0 54	0 00	0 00	0 72	0 88	0 15	4 74	15 50
1895.....	2 12	1 71	1 17	0 50	0 64	0 00	0 00	0 00	0 00	0 50	0 69	1 03	8 36
1896.....	5 50	0 00	2 10	1 72	0 29	0 00	0 19	0 53	0 00	0 91	1 94	1 04	14 22
1897.....	2 49	3 20	1 29	0 41	0 00	0 08	0 00	0 00	0 00	0 41	0 17	0 75	8 80
1898.....	0 86	1 13	1 34	0 07	0 98	0 00	0 00	0 00	0 53	0 11	0 20	0 42	5 69
1899.....	2 18	0 00	2 64	0 30	0 70	0 60	0 00	0 14	0 00	2 16	1 74	1 80	12 26
1900.....	1 63	0 05	1 07	1 83	0 97	T	T	0 00	T	0 81	4 16	0 57	11 09
Mean (29 years).....	2 10	1 31	1 44	1 06	0 56	0 15	0 01	0 02	0 18	0 51	1 21	1 70	10 26

## MODESTO, STANISLAUS COUNTY

[Elevation, 90 feet]

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1871.....	0 49	0 75	0 11	0 78	0 09	0 04	0 00	0 00	0 00	T	0 87	4 76	7 89
1872.....	3 16	2 20	0 94	0 78	0 00	0 00	0 00	T	0 00	0 00	0 40	3 10	10 58
1873.....	1 05	2 66	0 05	0 39	0 00	0 00	0 00	0 00	0 00	0 00	0 05	3 75	7 95
1874.....	4 00	0 56	1 00	0 57	1 00	0 43	0 00	0 00	0 75	1 32	1 88	0 00	11 51
1875.....	2 46	0 00	0 88	0 08	0 00	0 03	0 00	0 00	0 00	0 00	5 98	1 42	10 85
1876.....	2 36	1 55	1 71	0 35	T	0 00	0 15	0 00	0 00	1 38	0 20	0 00	7 70
1877.....	1 10	0 08	0 80	0 31	0 43	0 00	0 00	0 00	0 00	0 27	0 84	1 39	5 22
1878.....	3 70	2 76	1 80	0 75	T	0 00	0 00	0 00	0 00	0 42	0 33	0 57	10 33
1879.....	1 62	1 26	2 11	1 31	0 71	0 15	0 00	0 00	0 00	1 07	3 01	1 74	12 98
1880.....	0 43	1 31	0 70	4 11	0 51	0 00	0 00	0 00	0 00	0 00	0 60	3 55	11 21
1881.....	1 39	1 63	0 70	0 53	0 00	0 00	0 00	0 00	0 00	0 25	0 65	0 80	5 95
1882.....	0 99	0 62	1 85	0 79	0 50	0 19	0 00	0 00	0 58	0 64	2 07	0 12	8 35
1883.....	2 14	0 20	1 31	0 73	2 24	0 00	0 00	0 00	0 25	1 39	0 16	0 44	8 86
1884.....	0 75	2 01	3 89	2 84	0 15	0 99	0 00	0 00	0 00	1 20	0 00	2 62	14 45
1885.....	0 90	0 00	0 70	0 98	0 00	0 00	0 00	0 00	0 00	0 00	5 05	0 85	8 48
1886.....	2 54	0 10	1 46	2 79	0 00	0 00	0 00	0 00	0 00	0 25	1 01	0 65	8 80
1887.....	0 09	2 16	0 34	1 22	0 00	0 00	0 00	0 00	0 05	0 00	0 10	1 76	5 72
1888.....	1 72	0 53	1 36	0 27	0 69	0 10	0 00	0 00	0 51	0 00	1 86	1 40	8 44
1889.....	0 45	0 20	1 80	0 19	1 20	0 00	0 00	0 00	0 00	1 79	2 22	5 31	13 16
1890.....	3 95	1 03	0 88	0 63	0 59	0 00	0 00	0 00	1 27	0 02	0 00	2 14	10 51
1891.....	0 16	1 91	0 74	1 01	0 24	0 00	0 00	0 00	0 23	0 12	0 10	3 26	7 77
1892.....	0 70	1 91	2 43	0 46	1 14	0 00	0 00	0 00	0 00	0 68	2 69	2 44	12 45
1893.....	1 65	2 02	4 24	0 45	0 00	0 00	0 00	0 00	0 00	0 00	1 06	1 85	11 27
1894.....	3 36	3 13	0 00	0 23	1 72	0 00	0 00	0 00	1 20	0 61	0 28	5 42	16 00
1895.....	4 05	1 39	1 83	1 17	0 45	0 00	0 00	0 00	0 13	T	0 70	1 28	11 00
1896.....	4 56	0 00	0 90	2 22	0 51	0 00	0 30	T	0 25	1 06	2 97	1 31	14 10
1897.....	1 19	2 90	1 83	0 00	0 10	T	0 00	0 00	0 00	1 10	0 11	0 54	7 77
1898.....	0 49	0 71	0 35	0 00	0 57	0 00	0 00	0 00	0 31	0 50	0 38	0 88	4 19
1899.....	2 51	0 21	3 46	0 02	0 11	0 97	0 00	0 00	0 00	1 96	3 04	1 38	13 66
1900.....	1 30	0 29	0 98	1 70	1 26	0 00	0 00	0 00	0 13	0 72	4 24	0 92	11 54
Mean (30 years).....	1 84	1 20	1 37	0 92	0 47	0 10	0 02	T	0 20	0 56	1 43	1 86	9 96

## PRECIPITATION OF CALIFORNIA (INCHES AND HUNDREDTHS)—Continued.

## MOKELUMNE HILL, CALAVERAS COUNTY.

[Elevation, 1,550 feet.]

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1882.....	3.30	3.25	5.75	2.50	0.00	0.00	0.00	0.00	0.50	3.50	2.75	0.30	21.85
1883.....	2.70	0.75	4.75	2.05	3.85	0.00	0.00	0.00	0.77	1.53	1.16	1.58	19.14
1884.....	3.89	8.12	9.81	8.42	0.79	2.92	0.00	0.00	0.40	1.98	0.00	16.78	53.11
1885.....	1.62	0.25	0.51	1.89	0.09	0.52	0.00	0.00	0.17	0.00	15.17	3.78	24.00
1886.....	8.75	1.14	4.79	7.32	0.72	0.00	0.00	0.00	0.00	1.45	1.22	1.86	27.25
1887.....	1.49	9.01	0.84	4.81	0.18	0.00	0.00	0.00	0.76	0.00	0.76	4.29	22.14
1888.....	6.87	0.77	4.63	0.20	1.11	0.22	0.00	0.00	0.46	0.00	2.78	2.86	19.90
1889.....	0.51	1.41	6.83	1.15	4.04	0.10	T.	0.00	0.00	5.41	5.36	15.26	40.07
1890.....	9.22	5.57	8.37	2.51	2.89	0.00	0.00	0.00	1.78	0.00	0.00	4.68	35.02
1891.....	0.93	6.89	5.85	4.14	1.10	1.15	0.00	0.00	0.21	0.20	1.35	9.49	31.31
1892.....	1.88	3.69	5.60	2.38	3.75	0.40	0.00	0.00	0.62	1.04	8.08	6.04	33.43
1893.....	4.31	4.50	11.83	2.31	0.77	0.00	T.	0.00	1.63	0.40	5.04	3.35	34.16
1894.....	9.32	9.38	1.73	1.36	3.41	1.62	0.00	T.	1.18	4.34	1.12	14.31	47.77
1895.....	10.06	4.40	3.73	4.03	2.56	0.00	0.00	T.	0.83	0.12	1.12	2.88	29.73
1896.....	9.41	0.66	4.66	10.06	1.09	0.00	T.	0.22	0.10	1.42	8.98	3.84	40.34
1897.....	5.92	9.76	9.00	0.48	0.27	1.02	0.00	0.15	0.13	2.97	2.61	2.30	34.61
1898.....	1.62	4.45	1.18	0.47	2.13	0.22	T.	0.00	0.44	0.98	1.93	2.50	15.92
1899.....	4.52	0.70	13.27	1.11	1.58	0.20	0.00	T.	T.	5.45	5.79	6.09	33.71
1900.....	2.44	1.54	3.34	3.32	1.85	0.05	T.	T.	0.19	2.25	7.60	1.76	24.34
Mean (19 years).....	4.67	4.33	5.60	2.74	1.69	0.44	T.	0.02	0.58	1.74	3.82	5.47	31.20

## MOJAVE, KERN COUNTY.

[Elevation, 2,751 feet.]

1877.....	0.85	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.38	3.24
1878.....	1.22	1.74	0.30	0.76	0.00	0.02	0.00	0.10	0.29	0.00	0.32	1.07	5.82
1879.....	0.62	0.05	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.42	4.16	5.47
1880.....	0.40	0.50	0.71	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.03	3.24
1881.....	0.00	0.00	0.06	0.18	0.00	0.00	0.00	0.00	0.00	T.	T.	T.	0.24
1882.....	0.05	0.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63
1883.....	0.00	0.00	0.00	0.00	T.	0.00	0.00	0.00	0.00	0.10	0.00	0.25	0.35
1884.....	1.77	5.89	2.17	0.61	0.00	1.05	0.00	0.00	0.00	0.13	[0.31]	[1.59]	13.32
1885.....	0.00	0.06	0.00	0.61	0.14	0.00	0.71	0.00	0.00	0.00	1.25	1.16	3.98
1886.....	1.49	T.	1.22	0.14	0.00	T.	T.	0.00	0.00	T.	0.76	0.08	3.69
1887.....	T.	4.09	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.95	0.56	1.06	6.80
1888.....	2.62	1.56	1.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.18	2.23	10.34
1889.....	0.35	0.03	3.43	0.00	T.	0.00	0.00	0.81	0.27	2.21	0.45	7.30	14.85
1890.....	0.85	0.58	0.00	0.00	0.00	0.00	0.00	0.00	0.70	0.00	0.15	0.67	2.95
1891.....	0.00	2.33	0.19	0.36	0.00	0.00	T.	0.00	0.33	0.03	0.00	0.76	4.00
1892.....	1.00	0.47	1.61	0.00	0.26	0.00	0.00	0.00	0.00	0.00	0.27	0.56	4.17
1893.....	2.73	0.26	1.53	0.13	0.00	0.00	1.04	0.00	0.00	0.29	0.15	0.88	7.01
1894.....	0.43	0.54	0.24	T.	0.03	0.00	0.00	0.00	0.00	0.00	T.	3.68	4.97
1895.....	2.66	0.53	1.01	0.00	0.00	0.00	0.00	0.00	0.00	0.80	0.14	0.00	5.14
1896.....	1.31	0.00	1.45	0.00	0.00	0.22	0.12	0.00	0.00	0.70	0.17	0.82	4.79
1897.....	1.86	1.17	0.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.85
1898.....	0.60	T.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29	0.89
1899.....	0.37	0.00	0.48	0.00	T.	0.00	0.00	0.00	0.00	0.68	0.88	0.31	2.72
1900.....	0.31	0.00	T.	0.21	0.42	0.00	0.00	0.00	0.01	0.00	1.66	0.00	2.61
Mean (24 years).....	0.90	0.84	0.71	0.16	0.04	0.05	0.08	0.04	0.07	0.25	0.30	1.26	4.79

PRECIPITATION OF CALIFORNIA (INCHES AND HUNDREDTHS)—Continued

MONTEREY, MONTEREY COUNTY

[Elevation, 15 feet]

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1847 <sup>a</sup>	...	...	...	...	0 03	0 00	0 00	0 00	0 00	1 10	3 10	0 00	
1848	1 70	2 20	2 40	0 65	2 50	2 50	0 50	0 00					
1849	...	...	...	...	0 03	0 00	0 00	0 00	0 00	0 01	0 61	3 45	
1850	2 95	2 20	1 30	0 33	0 00	0 00	0 00	0 00	0 02	0 00	0 61	2 98	10 49
1851	...	...	...	...	...	...	0 01	0 00	0 01	0 20	0 91	4 50	
1852	0 40	0 30	6 12	0 92	0 10	0 16	0 00	0 00					
1859	...	...	...	...	...	...	...	...	...	...	3 03	2 86	
1860	0 98	0 54	7 02	2 60	2 05	0 17	0 40			0 70	0 11		
1861	...	...	...	...	0 10	...	...	...	...	...	...	...	
1863	...	...	...	...	...	...	...	...	...	...	2 01	0 69	
1864	4 28	0 04	1 60	1 23	1 35	0 06	0 00	0 10	0 00	0 30	4 13	3 99	17.08
1865	1 94	1 66	0 31	0 36	0 31	0 00	0 10	0 00	0 17	0 17	1 78	1 36	8 16
1866	6 07	1 16	3 13	0 99	0 86	0 14	0 00	0 02	0 00	0 00	2 33	6 86	21 56
1867	3 61	4 23	3 31	...	...	...	...	...	0 09	...	2 76	6 71	
1868	7 65	1 66	4 78	1 04	0 11	0 25	0 06	...	...	...	1 42	4 30	
1869	3 83	4 13	2 69	0 94	...	...	0 01	...	...	1 36	0 72	2 42	
1870	1 13	3 80	1 91	1 44	0 81	0 00	...	...	...	0 46	1 19	2 37	
1871	1 44	2 64	0 31	...	0 50	0 03	...	...	...	...	...	11 42	
1872	0 33	3 45	1 08	0 66	0 31	0 65	...	0 16	0 05	...	...	...	
1877	...	...	...	...	...	...	...	...	...	...	...	...	
1878	9 47	11 68	3 42	2 49	0 00	0 00	0 00	0 00	0 00	0 54	0 18	0 77	28 55
1879	3 54	2 36	2 32	1 77	0 41	0 00	0 00	0 00	0 00	0 54	1 00	3 49	15.48
1880	[3 08]	[2 55]	1 05	5 31	0 77	0 00	0 00	0 00	0 00	0 00	0 40	5 47	18.88
1881	2 70	2 07	1 55	1 37	0 00	0 20	0 00	0 00	0 00	0 60	1 20	2 13	11.82
1882	1 50	2 52	5 64	1 57	0 00	0 00	0 00	0 00	0 22	1 67	1 20	0 39	14 71
1883	2 60	2 22	5 68	1 42	0 99	0 10	0 00	0 00	0 19	0 71	0 39	1 16	15 46
1884	2 60	4 34	6 08	3 75	0 36	1 80	0 00	0 07	0 03	1 81	0 30	5 33	26.47
1885	1 22	0 09	0 40	1 70	0 20	0 03	0 00	0 00	0 00	0 00	6 55	1 73	11 92
1886	3 09	1 14	2 52	3 39	0 08	0 00	0 00	0 00	0 00	0 70	0 78	0 60	12 20
1887	0 35	4 92	0 60	1 16	0 00	0 05	0 00	0 00	0 25	0 00	1 35	1 81	10.49
1888	3 95	1 09	3 29	0 23	0 31	0 00	0 00	0 00	0 65	0 00	1 76	2 76	14.54
1889	0 31	0 94	3 58	1 15	1 22	0 00	0 00	0 00	0 00	4 28	1 62	11 51	25.14
1890 <sup>b</sup>	7 67	2 67	0 33	0 34	0 37	0 00	0 00	0 00	0 10	0 00	1 32	2 66	15 96
1891 <sup>c</sup>	1 06	3 68	0 95	2 36	0 09	0 08	0 00	0 00	0 11	0 02	0 19	1 72	13 26
1892	0 66	1 50	3 05	0 82	0 83	0 00	0 00	0 00	1 25	0 00	5 86	3 04	17.01
1893	1 73	3 34	5 78	1 41	0 46	0 00	0 00	0 00	0 12	0 95	0 00	1 87	14 76
1894	3 25	2 05	0 82	0 60	1 86	0 00	0 00	0 00	[0 08]	1 64	0 32	5 87	16.49
1895	6 30	[2 55]	1 94	0 89	0 58	0 00	0 00	0 00	0 00	0 78	0 82	1 46	15.82
1896	3 24	0 12	2 20	2 17	0 42	0 00	0 00	0 50	0 27	0 65	2 13	2 51	14 21
1897	1 10	3 63	3 70	0 40	0 08	0 32	0 00	0 00	0 12	0 70	0 40	1 25	11.70
1898	0 89	1 08	1 27	0 24	0 94	0 06	0 00	0 00	0 79	0 20	0 79	0 98	7.21
1899	2 79	0 66	3 07	0 50	0 50	0 05	0 00	0 09	0 00	3 69	2 31	1 39	15 05
1900	1 34	0 66	1 18	1 55	0 26	0 00	0 00	0 00	0 00	1 03	4 65	1 10	11.77
Mean (23 years, 1878-1900)	64 89	57 86	60 92	36 59	11 23	2 69	0 00	0 66	4 18	19 61	35 52	61 03	358.18

<sup>a</sup> Authority, Irrigation and Water Storage

<sup>b</sup> C S O, 1890

<sup>c</sup> C W B.



## PRECIPITATION OF CALIFORNIA (INCHES AND HUNDREDTHS)—Continued.

## NAPA, NAPA COUNTY.

[Elevation, 20 feet.]

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1877.....	5.88	1.59	0.55	0.50	0.69	0.04	0.05	0.00	0.00	0.53	1.97	1.96	13.76
1878.....	14.18	10.52	4.38	0.90	0.25	0.00	0.00	0.00	1.49	1.91	0.83	0.37	34.78
1879.....	4.06	6.00	8.36	1.56	1.50	0.07	0.00	0.00	0.00	0.47	2.56	4.76	29.34
1880.....	2.62	1.38	1.67	11.87	1.16	0.00	0.00	0.00	0.00	0.00	0.00	9.75	28.45
1881.....	11.69	3.97	0.88	1.14	0.06	0.75	0.00	0.00	0.13	1.01	1.62	4.21	25.41
1882.....	3.40	2.19	2.85	1.67	0.00	0.00	0.00	0.00	2.11	0.44	3.26	1.07	16.99
1883.....	2.04	1.12	4.41	1.45	4.04	0.00	0.00	0.00	0.95	1.27	2.12	0.60	18.00
1884.....	3.02	3.89	5.72	4.71	0.13	2.12	0.00	0.00	0.00	0.70	0.00	10.16	30.45
1885.....	1.96	0.40	0.43	1.51	0.00	0.00	0.00	0.00	0.05	0.61	8.51	4.35	17.82
1886.....	8.09	0.00	1.81	4.42	0.38	0.00	0.00	0.00	0.00	1.16	0.11	2.58	18.56
1887.....	1.87	10.68	0.67	2.27	0.17	0.00	0.00	0.00	0.00	0.00	1.35	4.18	21.19
1888.....	4.87	1.28	4.18	0.65	0.88	0.00	0.00	0.00	0.49	0.00	2.96	5.30	20.61
1889.....	0.87	0.98	8.87	0.52	2.17	0.00	0.00	0.00	0.00	5.32	3.88	12.23	34.84
1890.....	9.86	6.59	6.42	2.08	1.91	0.00	0.00	0.00	0.39	0.00	0.00	3.41	30.66
1891.....	1.17	8.70	2.33	3.54	1.37	0.32	0.16	0.00	0.58	0.30	0.53	7.11	26.11
1892.....	3.65	3.43	2.26	2.14	2.73	0.09	0.00	0.00	T.	1.58	5.30	7.56	28.74
1893.....	4.27	2.19	4.31	1.05	0.49	0.00	0.00	0.00	0.19	0.17	4.03	1.86	18.56
1894.....	8.17	2.97	1.15	0.61	1.49	0.85	T.	0.04	1.23	1.93	1.34	9.37	29.15
1895.....	9.35	2.92	2.21	1.11	0.85	0.00	0.08	0.00	1.16	0.08	1.72	1.47	20.85
1896.....	9.28	0.25	3.60	6.28	1.10	0.00	T.	0.46	0.50	1.20	5.03	3.41	31.11
1897.....	2.29	5.68	5.88	0.33	0.25	0.46	0.00	0.00	0.26	2.43	1.40	1.74	20.72
1898.....	1.22	3.76	0.14	0.34	1.64	0.37	0.00	0.00	0.59	0.88	0.65	0.97	10.56
1899.....	6.17	T.	5.98	1.00	0.40	0.47	0.00	0.17	0.00	3.89	4.73	3.30	26.61
1900.....	2.84	0.41	2.90	1.60	0.31	T.	0.00	0.00	0.10	1.50	6.33	2.21	18.20
Mean (24 years).....	5.12	3.37	3.41	2.22	1.00	0.23	0.01	0.03	0.43	1.14	2.51	4.35	23.81

## NEEDLES, SAN BERNARDINO COUNTY.

[Elevation, 477 feet.]

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1892.....	0.83	1.31	0.25	0.13	0.45	T.	0.10	0.00	T.	0.00	0.00	0.00	3.07
1893.....	T.	0.00	0.55	0.00	0.30	0.00	1.45	0.52	0.04	0.00	1.20	0.69	4.75
1894.....	0.00	0.12	0.65	0.00	T.	0.00	0.09	0.14	0.21	0.60	0.00	1.46	3.27
1895.....	1.38	0.03	0.06	0.09	0.00	0.00	T.	T.	0.18	T.	T.	0.00	1.74
1896.....	0.00	0.00	[0.27]	[0.04]	0.00	0.00	0.00	[0.28]	0.00	0.10	T.	1.38	2.02
1897.....	2.34	0.02	0.00	0.00	0.00	0.00	0.00	0.36	0.40	T.	0.06	0.10	3.28
1898.....	0.35	0.00	0.13	0.00	0.11	0.06	0.02	0.69	0.00	0.00	0.00	0.73	2.09
1899.....	0.58	T.	T.	0.00	0.09	0.08	1.00	0.00	0.28	0.19	0.73	T.	3.00
1900.....	0.02	0.00	T.	0.06	0.00	0.00	1.10	0.00	0.00	0.00	0.12	[0.62]	1.92
Mean (9 years).....	0.61	0.16	0.21	0.04	0.11	0.02	0.42	0.22	0.11	0.10	0.24	0.55	2.79

## CLIMATOLOGY OF CALIFORNIA.

## PRECIPITATION OF CALIFORNIA (INCHES AND HUNDREDTHS)—Continued.

## NEVADA CITY, NEVADA COUNTY

[Elevation, 2,580 feet ]

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1864 . . . . .	0 90	0 50	5 38	3 25	2 75	0 00	0 00	0 75	0 00	0 00	17 05	17 42	48 00
1865. . . . .	9 71	4 38	2 09	1 75	1 31	0 00	0 00	0 00	0 59	2 03	14 29	1 95	38 10
1866 . . . . .	15 47	5 60	14 24	0 59	4 50	0 00	0 00	0 00	0 00	0 00	9 61	32 70	82 71
1867 . . . . .	14 21	10 00	6 23	6 88	1 93	0 00	0 00	0 00	1 91	3 63	16 11	41 95	102 85
1868 . . . . .	11 01	6 36	23 30	7 22	1 50	2 72	0 00	0 00	0 34	0 43	1 49	16 62	64 54
1869. . . . .	16 85	12 62	6 96	5 72	1 62	0 04	0 00	0 00	0 15	0 50	4 67	6 29	57 42
1870 . . . . .	9 23	14 48	7 58	4 70	0 65	0 36	0 03	0 00	0 00	3 82	4 32	5 32	50 49
1871. . . . .	11 08	6 26	5 41	5 55	3 26	0 33	0 00	0 00	0 00	0 79	5 00	27 31	64 99
1872. . . . .	18 16	16 67	5 28	3 76	0 17	1 08	0 00	0 00	0 00	0 55	4 05	12 25	61 97
1873. . . . .	2 82	12 40	1 96	2 47	2 20	0 00	0 00	0 00	0 00	0 67	1 35	24 27	48 14
1874. . . . .	11 16	7 32	12 20	4 51	1 32	0 11	0 00	0 00	0 00	3 06	15 08	0 90	55 66
1875. . . . .	16 57	2 11	3 97	0 27	1 56	2 43	0 00	0 00	0 00	1 75	16 56	5 90	51 12
1876. . . . .	12 47	12 41	13 88	2 17	1 53	0 00	0 00	0 00	0 41	9 85	1 04	0 00	53 76
1877. . . . .	10 26	2 45	4 18	1 43	1 97	0 72	0 71	0 00	0 00	1 35	4 31	2 65	30 03
1878 . . . . .	17 62	16 61	10 05	2 80	1 05	0 00	0 00	0 00	0 69	2 32	2 88	0 96	54 98
1879. . . . .	11 62	10 97	19 28	5 90	3.83	0 43	0 00	0 05	0 00	3 15	5 50	8 76	69 49
1880 . . . . .	6 67	5 48	5 09	22 64	5 58	0 15	0 00	0 00	0 00	0 06	0 28	24 78	70 63
1881. . . . .	18 88	6 26	4 44	1 70	0 00	1 47	0 00	0 00	1 38	3 03	2 53	9 14	48 83
1882 . . . . .	7 29	5 42	9 21	4 39	0 52	0 60	0 00	0 00	2 22	7 65	5 34	3 87	46 51
1883 . . . . .	2 39	3 06	14 27	2 98	6 92	0 00	0 00	0 00	1 28	3 60	1 61	2 84	38 96
1884. . . . .	9 08	12 01	14 70	12 07	1 67	2 47	0 07	0 00	1 87	3 61	0 00	27 92	85 47
1885. . . . .	4 39	1 69	0 53	3 23	0 21	1 36	0 00	0 00	1 62	0 00	21 55	6 77	41 35
1886 <sup>a</sup> . . . . .	8 02	8 29	12 75	6 22	1 33	0 00	T	0 00	1 71	1 25	7 78	5 23	52.58
1887 . . . . .	11 71	10 85	3 26	2 17	3 54	1 85	0 00	T	1 21	4 83	1 38	20 61	61 41
1888 . . . . .	22 87	5 53	5 12	3 82	3 42	0 00	0 15	0 29	3 36	0 00	1 87	6 14	52 57
1889 . . . . .	19 61	0 99	7 39	13 63	4 88	T	0 05	0 05	1 55	2 18	12 63	6 46	69 42
1890 . . . . .	4 38	13 63	9 13	2 08	0 22	0 82	0 00	T	0 60	3 36	4 88	3 71	42 31
1891 . . . . .	1 92	9 91	0 87	0 95	2 73	1 27	0 00	T	0 37	1 96	3 49	2 27	25 74
1892 . . . . .	9 12	0 49	15 88	1 52	2 61	0 91	0 00	0 29	0 00	10 24	10 85	10 27	62 18
1893 . . . . .	7 81	2 36	7 51	4 83	1 90	0 03	0 00	0 00	0 55	5 52	9 22	4 00	43 73
Mean (30 years) .	10 78	7 57	8 40	4 70	2 22	0 62	0 03	0 05	0 73	2 71	6 87	11 11	55 80

## NEWCASTLE, PLACER COUNTY

[Elevation, 956 feet ]

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1892 . . . . .	3 98	3 71	5 14	2 48	4 23	0 03	0 00	0 00	0 06	1 57	8 66	6 39	36 25
1893 . . . . .	2 61	3 07	5 36	2 48	0 19	0 00	0 00	0 00	0 40	0 17	2 30	1 65	18 23
1894 . . . . .	3 55	4 68	0 59	1 22	1 65	1 76	0 00	0 00	0 00	2 88	0 95	8.70	25 98
1895 . . . . .	13 10	3 42	3 42	2 49	1.69	0 00	0 04	0 02	2 00	T	1 40	2 91	30 49
1896 . . . . .	10 08	0 66	4 81	6 92	1 79	0 00	0 04	0 31	1 28	1 07	8 16	2 46	37 58
1897 <sup>b</sup> . . . . .													
1898 <sup>b</sup> . . . . .													
1899 . . . . .	2 63	0 00	9 05	0 05	0 42	1 02	0 00	0 00	0 00	4 91	6 63	5 85	30 56
1900 . . . . .	4 95	0 94	3 38	2 40	1 62	0 00	0 00	0 00	0 25	3 58	5 77	1 65	24 54
Mean (7 years) . .	5 84	2 35	4 54	2 29	1 66	0 40	0 01	0 05	0 57	2 03	4 84	4 23	29 09

<sup>a</sup> Data missing, 1886-1892<sup>b</sup> No record for 1897-98

## PRECIPITATION OF CALIFORNIA (INCHES AND HUNDREDTHS)—Continued

## NEWHALL, LOS ANGELES COUNTY

[Elevation, 1,200 feet.]

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1877.....	1.56	T.	0.43	0.50	0.56	0.00	0.00	0.00	0.00	0.03	0.32	1.45	4.85
1878.....	3.78	3.23	1.02	1.46	0.15	0.00	0.00	0.00	0.00	0.00	0.00	2.33	11.97
1879.....	2.25	0.62	0.00	1.52	0.05	0.00	0.00	0.00	0.00	0.87	3.10	9.23	17.14
1880.....	0.10	2.25	1.08	3.39	0.00	0.00	0.00	0.00	0.00	0.00	0.26	6.22	13.80
1881.....	0.57	0.06	1.70	0.34	0.00	0.00	0.00	0.00	0.00	1.23	0.12	4.21	8.23
1882.....	0.43	2.36	4.71	0.93	0.00	0.00	0.00	0.00	0.00	0.16	1.20	0.00	9.79
1883.....	1.96	2.95	3.07	0.08	2.23	0.00	0.00	0.00	0.00	0.16	0.00	3.34	13.76
1884.....	6.66	14.53	9.73	3.85	2.17	1.67	0.00	0.00	0.00	0.60	1.10	3.89	44.20
1885.....	0.47	0.00	0.07	1.75	0.00	0.06	0.02	0.00	0.00	0.00	9.01	2.25	13.63
1886.....	5.22	0.69	3.11	4.27	0.00	T.	0.00	0.00	0.00	0.00	0.87	0.21	14.87
1887.....	0.00	12.38	0.15	1.96	0.10	0.03	0.00	0.00	0.02	0.65	1.46	4.26	21.01
1888.....	6.74	1.17	4.21	0.29	0.04	0.00	0.00	0.00	0.00	0.40	3.69	5.64	22.18
1889.....	0.35	1.11	9.39	0.40	0.56	0.00	0.00	0.36	0.00	8.19	3.36	15.70	39.42
1890.....	6.30	4.41	0.44	0.33	0.00	0.00	0.00	0.00	0.35	0.00	0.00	1.94	13.77
1891.....	0.31	9.99	0.88	1.26	0.66	0.00	T.	0.00	0.13	0.00	0.00	2.12	15.35
1892.....	1.32	3.02	4.07	0.06	2.08	0.00	0.00	0.00	0.00	0.30	4.72	4.16	19.73
1893.....	3.91	1.34	7.90	0.47	0.34	0.00	0.00	0.00	0.00	0.72	0.00	3.90	18.53
1894.....	0.85	0.29	0.62	0.15	0.66	0.00	0.00	0.00	0.80	0.00	0.00	7.59	10.96
1895.....	7.11	0.31	3.66	0.39	0.00	0.00	0.00	0.00	0.00	0.10	1.09	0.00	12.66
1896.....	2.15	0.15	4.04	1.03	0.20	0.00	0.00	0.25	0.00	1.55	1.00	2.23	12.60
1897.....	4.86	5.13	3.32	0.00	0.08	0.00	0.00	0.00	0.00	1.00	0.00	0.00	14.39
1898.....	0.45	[3.14]	0.00	0.10	0.93	0.00	0.00	0.00	0.14	0.00	0.00	0.22	4.98
1899.....	2.77	0.00	1.98	0.08	0.00	0.25	0.00	0.00	0.00	1.63	0.90	0.64	8.25
1900.....	0.89	0.00	1.97	0.25	1.31	0.00	0.00	0.00	0.00	0.08	5.24	0.00	9.74
Mean (24 years).....	2.54	2.88	2.81	1.03	0.51	0.08	T.	0.03	0.06	0.72	1.56	3.40	15.62

## NEWMAN, STANISLAUS COUNTY.

[Elevation, 92 feet.]

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1889.....	0.51	0.64	3.67	0.25	0.99	0.00	0.00	0.00	0.00	4.28	4.27	5.52	20.13
1890.....	4.56	3.34	0.80	0.70	0.20	0.00	0.00	0.00	1.31	0.00	0.00	1.17	12.08
1891.....	0.28	3.27	1.82	1.55	0.10	0.18	0.00	0.00	0.49	0.05	0.00	3.09	11.43
1892.....	0.27	1.45	1.77	0.55	0.81	0.00	0.00	0.00	0.00	0.28	1.46	4.24	10.83
1893.....	1.03	2.87	4.73	1.67	0.00	0.00	0.00	0.30	0.00	0.00	0.39	0.47	11.16
1894.....	1.97	0.89	0.00	T.	0.83	0.33	0.00	0.00	0.80	0.35	0.00	5.28	10.45
1895.....	3.34	0.87	1.77	0.80	0.90	0.00	0.00	0.00	0.10	0.00	0.48	0.40	8.66
1896.....	5.59	0.00	1.32	1.91	0.43	0.00	0.10	0.00	0.00	1.35	1.97	0.87	13.54
1897.....	1.83	2.61	1.85	0.47	0.02	0.20	0.00	0.10	T.	1.37	0.33	1.00	9.78
1898.....	0.45	0.84	0.80	0.03	0.75	0.00	0.00	0.00	0.07	0.13	T.	0.41	3.48
1899.....	2.19	0.00	2.05	0.30	1.05	0.07	0.00	0.00	0.00	1.65	2.41	1.25	10.97
1900.....	1.94	0.10	0.45	1.91	1.87	T.	0.00	0.00	0.32	0.35	4.45	0.81	12.20
Mean (12 years).....	2.00	1.41	1.75	0.84	0.66	0.06	0.01	0.01	0.26	0.82	1.31	2.09	11.23

## CLIMATOLOGY OF CALIFORNIA.

## PRECIPITATION OF CALIFORNIA (INCHES AND HUNDREDTHS)—Continued

## NILES (NEAR), ALAMEDA COUNTY

[Elevation, 87 feet]

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept.	Oct	Nov	Dec	Annual
1886..	5 63	0 73	1 67	4 19	0 25	0 01	T	0 00	0 00	0 64	1 20	1 14	15 55
1887 ..	1 07	7 62	1 01	1 87	0 14	0 07	0 01	0 00	0 65	T	0 84	3 25	16 39
1888..	3 99	1 80	3 07	0 15	0 78	0 40	0 00	T	0 39	0 07	3 87	2 53	17 05
1889..	0 55	0 42	5 59	0 95	1 59	0 01	0 00	0 00	0 00	4 30	3 44	12 13	28 98
1890..	7 18	3 63	3 03	1 12	1 08	0 00	0 00	0 00	0 45	0 00	0 00	3 05	19 54
1891..	0 65	4 72	2 57	2 23	1 10	0 06	0 00	0 00	0 21	0 06	0 37	6 45	18 42
1892..	1 12	1 41	3 71	1 10	1 96	T	0 03	0 00	0 01	1 53	3 49	5 28	19 61
1893..	2 65	2 73	5 58	1 67	0 47	0 02	0 00	0 00	0 14	0 23	2 44	2 69	18 62
1894..	7 28	4 99	1 23	0 54	1 94	0 43	T	0 00	1 42	1 49	0 84	9 45	29 61
1895..	6 81	2 55	2 15	1 73	0 86	0 00	T	0 00	0 75	0 72	1 80	1 86	18 73
1896..	7 45	0 30	1 06	4 47	1 07	0 00	0 10	0 83	0 57	1 22	6 16	2 91	26 74
1897.....	2 08	4 47	4 78	0 45	0 16	0 29	0 00	0 00	0 00	2 42	0 92	1 95	15 72
1898..	1 71	2 20	0 88	0 39	1 28	0 24	0 00	0 00	1 46	1 33	0 68	1 65	11 82
1899.....	2 78	0 49	6 09	0 26	0 66	0 49	T	0 09	0 00	4 24	3 30	2 91	21 31
1900..	3 49	0 87	1 87	0 91	0 79	0 08	T	0 00	0 02	2 02	4 67	1 65	16 37
Mean (15 years)	3 63	2 60	2 99	1 47	0 94	0 13	0 01	0 06	0 40	1 85	2 27	3 89	19 75

## NORTH BLOOMFIELD, NEVADA COUNTY

[Elevation, 3,200 feet]

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept.	Oct	Nov	Dec	Annual
1871 ..	7 54	5 94	5 03	4 36	3 36	0 12	0 00	0 00	0 00	0 83	6 20	25 19	58 57
1872 ..	12 71	18 22	5 73	3 84	1 39	0 41	0 00	0 00	0 16	0 53	4 47	11 77	59 23
1873..	4 16	11 09	2 50	2 40	1 57	0 00	0 10	0 00	0 00	0 67	3 37	19 00	44 86
1874 ..	15 17	7 08	11 16	4 04	1 78	0 25	0 00	0 02	0 06	4 88	13 52	1 21	59 17
1875..	0 15	0 88	3 56	0 30	2 68	0 63	0 00	0 00	0 00	2 09	15 53	7 64	33 46
1876..	10 98	10 20	13 02	4 03	1 06	0 01	1 78	0 01	0 81	10 46	0 85	0 00	52 69
1877..	9 98	2 89	4 92	3 07	2 66	0 91	0 00	0 00	0 00	1 10	4 22	1 96	31 71
1878 ..	15 72	16 97	9 23	2 44	0 95	0 00	0 00	0 00	0 00	3 84	3 72	1 18	53 55
1879 ..	10 00	9 49	16 62	6 69	3 84	0 64	0 00	0 24	0 00	3 03	6 43	18 57	70 55
1880 ..	5 96	5 66	5 45	23 31	5 63	0 00	0 00	0 00	0 00	0 00	0 41	21 10	67 52
1881..	19 46	12 13	4 92	2 59	1 33	1 57	0 00	0 00	1 75	3 88	4 05	8 73	60 39
1882..	8 02	6 77	10 02	5 39	1 82	0 00	0 00	0 00	2 74	0 86	5 72	3 59	50 98
1883..	3 69	3 94	10 45	3 39	0 00	0 00	0 00	0 00	1 79	3 66	1 48	2 84	31 24
1884..	9 21	10 02	15 65	10 31	2 66	4 03	0 00	0 00	1 98	3 43	0 00	37 21	94 50
1885 ..	3 65	1 91	0 79	3 62	0 71	2 14	0 00	0 00	2 55	0 00	20 23	7 98	43 58
1897 ..	5 06	16 57	11 15	3 70	0 20	1 45	0 00	0 11	0 57	5 05	6 12	5 41	55 39
1898 ..	2 28	13 03	0 79	1 18	4 47	1 70	T	T	0 58	2 87	5 66	4 10	36 66
1899 ..	10 88	1 01	18 24	1 98	3 91	0 65	0 00	0 67	0 00	14 52	13 33	13 09	78 28
1900..	9 32	5 20	9 64	6 82	2 44	T	0 01	0 00	0 95	8 32	10 99	4 95	58 64
1901.....	7 73	13 46	2 97	6 27	1 73	0 00	T	.....	.....	.....	.....	.....	.....
Mean (20 years)	8 46	8 99	7 71	3 74	2 12	0 82	0 11	0 02	0 78	3 10	6 00	10 15	53 18

## NORTH HILL VINEYARD, CALAVERAS COUNTY

[Elevation, 660 feet]

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept.	Oct	Nov	Dec	Annual
1890 ..	5 74	2 33	2 29	1 33	2 43	0 00	0 00	0 00	0 50	T	T	2 82	17 24
1891 ..	0 39	2 71	3 55	2 70	0 37	0 22	0 00	0 00	0 23	0 02	0 25	4 85	15 29
1892..	1 34	1 71	3 62	1 63	3 02	0 33	0 00	0 00	0 25	1 18	5 33	4 54	22 95
1893 ..	3 70	2 87	7 51	1 32	0 00	0 00	0 02	0 00	0 58	0 02	1 94	2 66	20 62
1894 ..	6 31	7 05	1 16	0 98	3 21	1 46	T	T	1 51	1 77	1 28	10 58	35 21
1895 ..	8 65	2 30	2 31	2 91	1 10	0 00	T	0 00	0 59	0 08	1 11	3 09	22 14
1896 ..	9 30	0 10	2 76	6 24	0 71	0 00	T	0 01	0 04	1 45	5 01	3 72	29 34
1897 ..	3 22	6 63	5 37	0 47	0 33	0 58	0 00	0 01	0 18	2 30	1 07	1 50	22 16
1898 ..	1 22	4 03	0 92	0 57	1 41	0 09	0 00	0 00	0 58	1 05	1 20	3 35	14 42
1899 ..	4 65	0 24	10 88	0 42	1 31	0 40	0 00	0 12	0 00	4 49	3 87	3 02	29 90
1900 ..	1 57	0 71	3 38	3 67	1 49	0 01	0 00	0 00	0 17	1 15	4 25	0 97	17 87
Mean (11 years)	4 19	2 79	3 98	2 02	1 49	0 28	T	0 01	0 42	1 23	2 30	3 71	22 42

## PRECIPITATION OF CALIFORNIA (INCHES AND HUNDREDTHS)—Continued.

## NORTH ONTARIO, SAN BERNARDINO COUNTY.

[Elevation, 1,750 feet.]

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1897.....	5.26	7.82	5.23	0.00	0.90	0.00	0.00	T.	0.00	3.71	0.40	0.43	24.05
1898.....	2.30	1.11	1.55	0.50	2.75	0.00	0.06	0.00	T.	0.28	0.12	0.55	9.22
1899.....	2.88	0.63	2.71	0.19	0.05	0.90	0.00	T.	0.05	1.73	1.78	1.05	11.97
1900.....	1.75	0.19	1.93	1.68	2.77	0.00	0.00	0.00	0.64	0.40	8.17	0.00	17.53
1901.....	5.33	6.10	0.72	0.78	1.50	0.00	0.00	.....	.....	.....	.....	.....	.....
Mean (5 years) .....	3.60	3.17	2.55	0.63	1.59	0.18	0.01	.....	.....	.....	.....	.....	.....

## NORTH SAN JUAN, NEVADA COUNTY.

[Elevation, 2,130 feet.]

1897.....	4.20	13.70	7.88	2.20	0.03	1.45	0.00	0.03	0.74	4.33	5.80	1.65	42.01
1898.....	3.11	8.72	0.54	1.00	4.16	0.74	0.00	T.	0.88	3.49	4.56	1.88	29.08
1899.....	10.25	0.85	16.02	1.36	3.00	0.40	0.00	0.66	0.00	10.04	11.92	12.41	66.91
1900.....	6.36	3.88	5.34	4.87	1.16	T.	T.	0.00	T.	7.77	8.81	5.07	43.26
1901.....	11.97	12.44	4.51	4.59	1.31	0.00	T.	.....	.....	.....	.....	.....	.....
Mean (5 years) .....	7.18	7.92	6.86	2.80	1.93	0.52	T.	.....	.....	.....	.....	.....	.....

## OAKDALE, STANISLAUS COUNTY.

[Elevation, 156 feet.]

1893.....	1.88	2.36	5.29	0.78	0.21	0.00	T.	0.00	0.28	0.00	1.45	1.60	13.85
1894.....	5.46	5.20	0.50	0.88	2.38	1.05	0.00	0.00	0.36	1.23	0.65	7.71	25.42
1895.....	5.72	2.24	2.01	1.62	0.51	0.00	0.00	0.00	0.20	0.29	1.03	1.24	14.86
1896.....	5.28	0.00	1.44	3.84	0.58	0.00	0.00	0.10	0.00	1.61	3.07	1.53	17.45
1897.....	2.58	3.46	2.72	0.65	0.06	0.12	0.00	0.04	0.24	1.53	0.54	1.25	13.19
1898.....	0.68	1.01	0.25	0.15	1.52	0.00	0.00	0.00	0.00	0.76	0.49	1.63	6.49
1899.....	2.28	0.11	4.64	0.04	0.00	1.56	0.00	0.04	0.00	2.77	3.21	1.82	16.47
1900.....	1.49	0.18	2.14	2.80	1.60	0.00	0.00	0.00	0.00	0.95	5.61	1.08	15.85
Mean (8 years) .....	3.17	1.82	2.37	1.34	0.86	0.34	T.	0.02	0.14	1.14	2.00	2.23	15.45

## OGILBY, SAN DIEGO COUNTY.

[Elevation, 354 feet.]

1890.....	0.29	0.36	0.00	0.00	0.02	0.00	0.00	0.05	0.00	0.14	0.02	0.31	1.19
1891.....	0.00	1.30	0.00	0.00	0.00	0.00	0.00	0.46	0.02	0.00	0.00	0.00	1.78
1892.....	0.55	1.22	1.07	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.94
1893.....	T.	0.00	0.19	0.00	0.38	0.00	1.02	0.03	0.39	0.00	0.27	0.28	2.51
1894.....	0.00	0.00	0.26	0.00	0.00	0.00	0.00	0.00	0.64	0.00	0.00	0.00	0.90
1895.....	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.15	0.75
1896.....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00
1897.....	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00
1898.....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	T.	T.
1899.....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1900.....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	T.	0.00	0.00	0.00	T.
Mean (11 years) .....	0.21	0.26	0.14	0.00	0.05	0.00	0.09	0.05	0.10	0.01	0.04	0.15	1.10

## CLIMATOLOGY OF CALIFORNIA.

## PRECIPITATION OF CALIFORNIA (INCHES AND HUNDREDTHS)—Continued.

## OLETA, AMADOR COUNTY

[Elevation, 1,510 feet]

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1892 . . . . .	3 44	4 52	7 59	3 04	4 54	0 25	0 00	0 00	0 00	1 50	10 70	7 51	43.09
1893 . . . . .	6 88	4 88	11 40	2 65	0 63	0 00	0 00	0 00	0 00	0 38	4 53	3 18	34 53
1894 . . . . .	7 23	9 01	1 11	1 13	3 69	1 06	T	T	1 38	4 50	1 37	16 55	47 03
1895 . . . . .	13 25	5 75	3 94	4 25	2 25	0 00	T	T	2 13	0 12	0 74	3 50	35 93
1896 . . . . .	9 94	0 87	5 41	9 55	2 41	0 06	0 00	0 24	0 12	1 06	8 05	4 51	42 22
1897 . . . . .	5 49	14 44	8 13	1 50	0 35	0 74	T	T	0 12	3 00	2 20	3 01	38 98
1898 . . . . .	1 64	5 80	1 86	0 68	1 96	0 35	T	0 00	0 80	2 34	2 24	7 82	17 47
1899 . . . . .	5 29	0 96	12.43	1 33	1.01	0 71	0 00	0 17	T	6 98	5 42	7 82	42 12
1899 . . . . .	2 33	2 90	4 66	3 87	1 24	0 03	T	0 00	0 80	2 76	7 76	1 61	27 46
1900 . . . . .	2 33	2 90	4 66	3 87	1 24	0 03	T	0 00	0 80	2 76	7 76	1 61	27 46
Mean (9 years) . .	6 17	5 46	6 23	3 11	2 01	0 36	T	0 05	0 48	2 34	4 79	5 55	36 54

## ORLAND, GLENN COUNTY

[Elevation 254 feet]

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1883 . . . . .	0 52	0 27	1 49	0 86	2 07	0 02	0 00	0.00	0 80	1 60	0 12	0 29	8 04
1884 . . . . .	3 88	1 58	4 31	2 97	0 23	2 55	0 00	0 00	0.20	0 80	0 00	4 03	20 05
1885 . . . . .	1 34	0 58	0 00	0 51	0 82	0 50	0 00	0 00	0 22	0 00	9 41	3 03	16 41
1886 . . . . .	4 45	0 50	1 01	2 70	0 64	0 00	0 00	0 00	0 00	0 50	T	1.77	11 57
1887 . . . . .	0 33	3 74	1 63	2 06	0 00	0 15	0 00	T	0 00	0 00	1 14	2 64	11 69
1888 . . . . .	4 11	1 56	2 78	0 57	0.24	0 53	0 00	0 00	0 27	0 00	2 79	3 47	16 27
1888 . . . . .	0 22	0 58	4 52	1 02	1 37	0 38	0 00	0 00	0 00	7 96	2.20	6 80	25.05
1889 . . . . .	3 29	1 63	3 59	0 53	1 75	0 00	0 00	0.00	0 00	0 00	0 00	2 46	13 25
1890 . . . . .	0 55	7 88	0 33	1 38	1.12	1 40	0 00	0 00	0 09	0.63	0 36	2 21	15 95
1891 . . . . .	8.08	1 93	1 87	1 16	2 50	0 20	0 00	0 00	0 00	0 95	4 77	5 67	22 13
1892 . . . . .	4 13	3 22	3 47	1 79	0 00	0 00	0 00	0 00	0.91	0 43	1 97	1.23	17 15
1893 . . . . .	3 13	2 75	0 40	0 53	1 08	0 35	0 00	0 00	0 80	0 72	0 43	7.89	13 08
1894 . . . . .	8 25	2 66	2 09	1 24	0 58	0 00	0 27	0 00	1 67	0 00	1 34	1 15	19 25
1895 . . . . .	8 54	0.05	4 25	3 03	1 65	0 00	T	0 37	0 83	1 02	2 69	6 14	28 57
1896 . . . . .	3 58	4 01	1 92	1 79	0 00	0.60	0 00	0 00	0 10	0 00	0 73	1 41	14 14
1897 . . . . .	0 36	3 64	T	0 00	1 65	0 00	0 00	0 00	0 40	0 32	0 34	1 22	7 93
1898 . . . . .	6 98	T	4 17	0 45	0 94	0 57	0 00	0 00	0 00	2 08	4 58	2 69	22 41
1899 . . . . .	2 53	0 84	1 32	2 72	1 05	0 31	0 00	0 07	0 07	3 20	4 61	1 68	18 40
1900 . . . . .	3 27	2.08	2 17	1 41	0 98	0 42	0.02	0 02	0 35	1.12	2 08	3 10	17 02
Mean (18 years) . . . . .	3 27	2.08	2 17	1 41	0 98	0 42	0.02	0 02	0 35	1.12	2 08	3 10	17 02

## OROVILLE, BUTTE COUNTY

[Elevation, 188 feet]

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1885 . . . . .	2 10	0 73	0 25	1 64	0 65	0.39	T	0 00	0 20	T	11 27	5 53	22.76
1886 . . . . .	5 17	0 36	2 70	5 48	0 50	0 00	T	T	0 00	0 63	0 29	2 52	17 65
1887 . . . . .	1 02	3.93	0 98	2 81	0 08	0 18	T	0 01	0 15	0 00	1.21	2 62	17 99
1888 . . . . .	7 72	0 99	3.44	0 14	0 32	1 16	0 07	T	0 63	0 00	4 14	7 91	26 52
1889 . . . . .	0.16	0 57	3 98	1 61	3.07	0 42	0 00	0 00	0 06	7 41	4 89	13 50	40 61
1890 . . . . .	4 00	5.95	7 07	2 47	3 84	0 45	0 00	0 00	0 75	0 00	0 75	4 61	29 89
1891 . . . . .	2 50	9 04	0 69	1 73	1 30	0 00	0 00	0 00	0 08	0 34	1 56	4 97	22.16
1892 . . . . .	4 60	3.81	4 82	3 53	3 24	0 00	0 00	0 00	0 00	1 22	6 99	3 52	31.73
1893 . . . . .	4 06	3 82	6 47	1 21	1 17	0 00	0 00	0 00	0 92	0 10	4 03	2 18	23.96
1894 . . . . .	5 97	3 21	0 95	1 20	2 85	0 45	0 00	0 00	0.86	2 40	1 07	11 48	30 44
1895 . . . . .	11 92	0 85	2 60	2 65	0 65	0 00	0 33	0 00	4 25	0 11	1 85	2 59	27 80
1896 . . . . .	11 41	0 33	4 19	7 03	2 08	0 00	0 15	0 23	1 40	0 90	6 30	4 64	38.71
1897 . . . . .	4 20	3 60	2 23	0 35	0 30	0 30	0 00	0 00	0 80	2 95	2 65	1.95	24 33
1898 . . . . .	1 01	0 03	0 07	0 58	1 63	0 30	0 00	0 00	0 39	0 85	1.12	1 80	13.78
1899 . . . . .	7 24	0 00	6 89	0.71	3 25	1 22	0 00	0 15	0 00	8 31	7 59	4 38	39 74
1900 . . . . .	5 79	1 07	2 79	3 25	1 03	0 35	0 00	0 00	0 44	3.28	4 20	2 48	24.63
Mean (16 years) . . . . .	4 93	3 33	3 44	2 27	1 62	0 33	0 03	0.02	0 68	1 78	3 74	4.79	27 04

## PRECIPITATION OF CALIFORNIA (INCHES AND HUNDREDTHS)—Continued.

## PALERMO, BUTTE COUNTY.

[Elevation, 218 feet.]

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1892.....	2.94	3.68	3.92	4.08	2.81	0.14	0.00	0.00	T.	1.19	6.44	6.29	31.44
1893.....	3.77	2.92	3.81	1.00	1.60	0.00	0.00	0.00	0.50	0.14	2.58	1.76	18.08
1894.....	3.76	2.34	0.79	0.74	3.41	0.30	T.	0.00	0.83	2.46	1.07	10.20	25.90
1895.....	10.08	2.83	1.91	1.96	0.76	0.00	0.30	0.05	3.76	0.06	1.20	0.67	23.58
1896.....	10.08	0.26	2.31	3.78	0.80	0.00	0.03	0.22	1.17	0.54	5.83	3.98	28.95
1897.....	3.85	6.79	1.92	0.76	0.20	0.89	0.00	0.03	0.33	3.50	2.07	0.45	20.32
1898.....	1.24	0.83	0.00	0.59	1.75	0.12	0.00	0.00	0.34	0.94	1.16	1.55	8.52
1899.....	5.45	0.00	5.88	0.16	0.92	1.30	0.00	0.18	0.00	5.76	6.46	3.72	29.83
1900.....	5.80	0.72	2.29	1.86	0.87	0.20	0.00	0.00	0.27	3.43	3.63	2.15	21.22
Mean (9 years).....	5.16	2.26	2.54	1.66	1.46	0.33	0.04	0.06	0.80	2.00	3.38	3.42	23.09

## PALM SPRINGS, RIVERSIDE COUNTY.

[Elevation, 584 feet.]

1889.....	0.30	0.06	1.54	0.00	0.01	0.00	0.00	0.07	0.00	0.53	0.00	4.64	7.15
1890.....	0.52	0.10	0.00	0.00	0.00	0.00	0.00	0.25	0.38	0.00	0.00	0.50	1.75
1891.....	0.00	7.44	0.00	0.00	0.00	0.00	0.03	1.02	0.10	0.00	0.00	0.23	8.82
1892.....	2.18	0.28	0.05	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.61
1893.....	0.40	0.00	1.18	0.00	0.10	0.00	0.35	0.40	0.10	0.00	3.00	0.11	5.64
1894.....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.25	4.25
1895.....	3.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.50	3.50
1896.....	0.00	0.00	0.81	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.84
1897.....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.09	1.09
1898.....	0.00	0.00	0.60	0.00	T.	0.00	0.00	0.00	0.00	0.00	0.00	0.70	1.80
1899.....	1.21	0.12	0.00	0.00	0.00	0.00	0.00	0.62	T.	0.00	0.50	2.86	5.81
1900.....	0.80	0.00	0.00	0.00	0.00	0.00	T.	0.00	0.00	1.29	T.	0.00	2.09
Mean (12 years).....	0.74	0.66	0.35	T.	0.02	0.00	0.03	0.19	0.05	0.15	0.29	1.20	3.53

## PASADENA, LOS ANGELES COUNTY.

[Elevation, 828 feet.]

1893.....	7.53	3.03	10.47	0.66	0.20	0.06	0.01	T.	0.04	0.71	0.18	4.08	26.97
1894.....	1.45	0.74	0.96	0.13	0.61	0.00	0.00	0.09	0.85	0.02	0.01	5.89	10.75
1895.....	7.56	[1.81]	4.27	0.61	0.41	[0.01]	0.00	0.00	T.	[0.96]	[0.40]	[2.64]	18.69
1896.....	2.71	0.00	2.88	0.00	0.00	0.00	0.00	0.00	0.00	1.74	1.79	2.07	11.19
1897.....	3.69	4.78	2.43	0.14	0.00	0.00	0.00	0.00	0.00	2.42	0.00	0.62	14.08
1898.....	1.85	0.50	1.05	0.14	1.35	0.00	0.00	0.00	0.00	0.00	0.00	0.55	5.44
1899.....	3.55	0.00	1.89	T.	0.00	0.65	0.00	0.00	0.00	1.98	1.40	0.89	10.36
1900.....	0.88	0.00	1.15	0.48	1.76	0.00	0.00	0.00	T.	0.00	8.86	0.00	13.13
Mean (8 years).....	3.65	1.36	3.14	0.27	0.54	0.09	T.	0.01	0.11	0.98	1.58	2.09	13.83

## PASO ROBLES, SAN LUIS OBISPO COUNTY.

[Elevation, 800 feet.]

1887.....	0.51	6.14	0.34	1.10	0.44	0.00	0.00	0.00	0.00	0.21	0.60	2.61	11.95
1888.....	5.60	0.30	4.50	0.20	0.28	0.00	0.00	0.00	0.01	0.00	4.02	2.80	17.71
1889.....	0.78	0.98	5.55	0.45	1.25	0.00	0.00	0.00	0.00	5.61	1.69	9.13	25.44
1890.....	6.75	5.40	1.74	0.03	0.22	0.00	0.00	0.00	0.65	0.00	0.30	3.34	18.43
1891.....	0.52	7.27	2.51	1.72	0.06	0.05	0.00	0.00	0.41	0.00	0.00	4.09	16.63
1892.....	0.63	1.39	3.09	0.11	1.88	0.38	0.00	0.00	0.00	0.46	2.06	5.02	15.02
1893.....	3.28	4.09	6.28	1.09	0.27	0.00	0.00	0.00	0.00	0.24	0.00	2.38	17.63
1894.....	1.06	0.59	0.22	0.24	1.09	0.12	0.00	0.50	1.13	0.33	0.09	6.14	11.51
1895.....	6.43	0.47	1.28	0.48	0.08	0.00	0.00	0.00	0.00	0.61	1.53	0.55	11.43
1896.....	4.64	0.02	3.77	1.25	0.77	T.	T.	1.19	T.	1.66	1.92	2.43	17.70
1897.....	3.65	4.18	2.88	T.	0.00	0.00	0.00	0.02	0.03	0.56	0.05	0.23	11.80
1898.....	0.82	1.55	0.83	0.00	0.68	0.00	0.00	0.00	0.10	0.13	0.30	0.27	4.68
1899.....	4.16	0.08	4.99	1.87	T.	0.13	0.00	0.00	T.	2.55	1.40	2.53	17.21
1900.....	2.11	0.08	1.90	0.42	0.67	T.	T.	T.	T.	1.54	6.10	0.25	13.07
Mean (14 years).....	2.92	2.32	2.85	0.60	0.55	0.05	T.	0.12	0.17	0.92	1.43	2.92	15.00

## CLIMATOLOGY OF CALIFORNIA.

## PRECIPITATION OF CALIFORNIA (INCHES AND HUNDREDTHS)—Continued.

## PEACHLAND, SONOMA COUNTY

[Elevation, 220 feet ]

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct.	Nov	Dec	Annual
1896	17 55	0 40	3 85	6 03	2 26	0 00	0 07	0 08	0 60	2 59	5 53	8 88	47 79
1897.	5 60	8 63	6 62	0 12	0 51	1 31	T	T	0 13	3 17	2 34	4 01	32 41
1898	2 15	8 28	0 16	0 37	3 87	0 41	T	T	0 89	0 85	1 25	1 38	19 61
1899	16 16	0 19	10 25	0 35	1 99	0 01	T	0 19	0 00	6 57	8 46	6 20	50 87
1900	7 88	1 15	4 88	4 16	1 03	0 31	T	T	0 19	6 09	5 86	5 10	36 65
Mean(5 years).....	9 87	3 73	5 15	2 21	1 93	0 41	0 01	0 05	0 36	3 85	4 69	5 10	37 87

## PLACERVILLE, ELDERADO COUNTY

[Elevation, 1,820 feet ]

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct.	Nov	Dec	Annual
1874	12 58	4 72	10 77	3 92	1 96	0 00	0 00	0 00	0 00	3 42	9 59	1 18	48 14
1875.	12 58	0 08	2 88	0 61	1 58	1 84	0 00	0 00	0 00	1 20	17 64	6 75	45 16
1876.	10 79	8 01	11 86	3 60	1 40	0 00	0 49	0 07	0 02	6 16	0 78	0 00	43 18
1880	4 38	5 81	4 66	17 52	3 95	0 00	0 00	0 00	0 00	0 35	0 58	16 94	54 19
1881	15 53	7 01	3 38	2 36	T	1 89	T	0 00	1 08	2 80	2 87	7 70	44 62
1882	6 71	5 15	9 30	5 53	1 19	0 13	T	0 00	0 93	5 72	4 94	1 98	41 55
1883	3 74	2 58	6 88	3 54	6 25	0 00	T	0 00	1 67	3 38	1 67	2 63	32 34
1884	6 06	11 56	14 46	11 82	1 60	2 51	T	0 03	0 85	2 47	0 10	22 65	74 11
1885	4 15	0 97	0 33	3 32	0 27	1 42	0 00	0 00	0 55	0 00	15 97	5 22	32 20
1886	13 03	1 15	5 22	11 75	1 24	0 50	0 00	0 00	0 00	1 42	0 91	5 02	40 24
1887.	3 18	14 18	2 09	5 71	0 53	0 28	0 00	0 00	0 58	0 06	1 42	8 34	36 87
1887.	11 27	2 39	5 26	0 91	1 10	1 50	0 04	T	0 88	T	5 98	7 06	36 39
1888	1 08	0 86	9 78	1 93	8 05	0 16	0 00	T	0 00	9 07	7 77	18 18	56 83
1889	14 57	7 46	13 81	3 86	4 01	0 00	0 00	T	1 64	T	T	6 89	51 74
1890	1 40	9 29	8 18	4 29	1 91	1 20	0 00	0 00	0 37	0 32	1 97	12 57	41 50
1891	4 43	6 88	8 26	4 33	5 35	0 00	0 00	0 00	0 20	2 23	12 14	15 48	59 25
1892	7 14	6 94	12 39	5 31	1 71	0 00	T	0 00	1 26	0 96	5 74	4 68	46 13
1893	11 05	13 02	2 94	2 24	4 70	1 63	T	0 10	1 52	3 33	1 06	18 49	60 68
1894	17 85	5 07	4 43	4 75	2 58	0 00	T	T	1 79	0 16	0 77	5 24	42 64
1895	16 38	0 78	11 11	12 00	3 56	0 00	0 03	0 15	0 63	1 51	11 71	4 07	61 93
1896	4 68	14 61	9 49	2 23	0 36	1 09	0 00	0 05	0 13	3 39	2 68	2 43	41 14
1897	1 78	6 18	1 28	0 58	2 70	0 66	T	T	0 11	1 00	2 30	2 80	19 39
1898.	5 62	0 48	14 98	2 01	1 78	0 88	0 00	0 10	0 00	7 73	6 72	8 32	48 02
1899.	3 92	2 89	5 84	4 32	1 15	[0 68]	T	0 00	0 55	3 62	9 82	3 30	36 09
1900	8 08	5 75	7 48	4 91	2 45	0 68	0 02	0 02	0 62	2 54	5 21	7 83	45 60
Mean(24 years) ..	8 08	5 75	7 48	4 91	2 45	0 68	0 02	0 02	0 62	2 54	5 21	7 83	45 60

## POINT LOBOS

[Elevation, 250 feet ]

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct.	Nov	Dec	Annual
1898..	3 19	2 53	3 74	1 01	0 19	0 01	T	0 14	0 14	0 28	3 59	1 05	15 87
1894	5 17	2 48	0 62	0 15	1 71	0 55	T	T	1 40	1 36	0 68	9 21	23 33
1895.	5 61	2 30	1 91	1 09	0 75	0 00	0 03	0 01	0 88	0 11	2 33	1 06	16 08
1896.	7 33	0 41	3 45	3 99	0 91	T	0 02	0 26	0 46	1 58	4 99	4 16	27 56
1897	2 91	4 47	4 91	0 12	0 71	0 25	0 00	0 02	0 09	2 13	1 20	1 54	18 35
1898	1 78	2 64	0 47	0 12	1 17	0 25	0 00	0 02	1 00	0 72	0 63	1 61	10 41
1899	4 93	0 18	7 86	1 05	0 86	0 02	0 00	0 00	0 00	3 19	3 58	3 41	25 08
1900	4 57	0 96	2 23	1 44	0 14	0 00	0 00	0 06	0 59	1 26	3 49	1 37	16 11
Mean (8 years) ..	4 44	2 00	3 15	1 12	0 80	0 14	0 01	0 06	0 57	1 33	2 56	2 93	19 10

## POINT REYES LIGHT

[Elevation, 650 feet ]

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct.	Nov	Dec	Annual
1892	4 68	4 37	3 86	2 26	2 97	0 36	0 45	0 27	0 68	1 54	3 22	4 72	28 88
1893	3 21	2 58	3 09	1 33	0 91	0 08	0 02	0 00	0 69	0 54	5 43	3 49	26 87
1894..	8 26	2 39	2 06	0 66	2 31	1 16	0 00	0 00	2 64	2 42	1 04	9 50	32 44
1895	9 43	1 34	2 63	1 02	1 29	0 02	0 40	T	1 72	0 42	2 52	2 27	28 06
1896	8 30	0 97	3 25	4 20	1 24	0 00	0 00	0 02	0 43	1 76	4 85	5 40	30 42
1897..	2 74	4 93	5 87	0 47	0 02	0 42	0 00	0 00	0 47	2 81	1 99	1 88	21 55
1898	1 60	4 48	0 47	0 29	2 82	0 42	0 00	T	0 80	1 27	1 00	0 85	14 00
1899	7 11	0 53	5 56	0 86	2 02	0 18	0 00	0 91	0 00	5 41	6 43	3 70	32 71
1900.	6 46	0 99	2 45	2 51	0 17	0 02	0 00	0 00	0 87	2 72	4 16	1 93	22 28
Mean (9 years) ..	5 75	2 51	3 75	1 57	1 53	0 30	0 10	0 13	0 92	2 10	3 40	3 74	25 80



## GENERAL PRECIPITATION TABLES.

197

## PRECIPITATION OF CALIFORNIA (INCHES AND HUNDREDTHS)—Continued.

## POMONA (NEAR), LOS ANGELES COUNTY.

[Elevation, 860 feet.]

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1894.....	2.36	0.82	0.65	0.08	0.86	0.00	0.00	0.00	0.44	0.04	0.00	8.48	13.23
1895.....	8.74	1.89	3.56	0.66	0.00	0.00	0.00	0.00	0.00	0.08	1.08	0.66	16.16
1896.....	2.42	0.00	4.39	0.15	0.00	0.00	0.09	0.00	0.00	1.45	1.19	1.57	11.26
1897.....	5.54	6.16	3.34	T.	T.	0.00	0.00	0.00	0.22	1.26	0.51	0.96	17.99
1898.....	2.13	0.81	1.22	0.06	2.22	0.00	0.00	0.00	0.00	0.09	0.08	0.51	7.12
1899.....	2.79	0.04	2.10	0.10	0.00	0.73	0.00	0.00	0.00	1.92	1.39	0.95	10.02
1900.....	1.30	0.05	1.02	0.95	2.00	0.00	0.00	0.00	0.00	0.34	8.38	0.00	14.04
Mean (7 years) .....	3.61	1.32	2.33	0.29	0.65	0.10	0.01	0.00	0.09	0.74	1.80	1.88	12.83

## PORTERVILLE, TULARE COUNTY.

[Elevation, 461 feet.]

1889.....	0.82	0.18	1.26	0.42	0.89	T.	0.00	T.	0.00	3.41	0.45	3.23	10.66
1890.....	3.43	0.49	1.30	0.12	0.20	0.00	0.00	0.15	0.00	0.00	0.40	2.73	8.87
1891.....	0.36	2.43	0.71	1.14	0.29	0.00	0.00	0.00	0.01	0.00	0.36	3.38	8.68
1892.....	0.26	1.33	2.21	0.16	0.65	0.22	0.00	0.00	0.00	0.17	0.54	2.43	7.97
1893.....	0.33	1.85	3.63	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.61	7.31
1894.....	1.52	0.83	0.71	0.32	0.42	1.09	0.00	0.00	0.43	0.15	0.04	3.13	8.04
1895.....	3.82	1.54	1.10	0.41	0.35	0.00	0.00	0.00	T.	0.23	1.71	0.51	9.67
1896.....	1.61	T.	0.67	1.13	0.13	0.00	0.69	0.00	T.	0.65	0.94	0.93	6.75
1897.....	1.96	2.46	2.00	0.30	0.42	0.00	0.00	0.00	0.00	1.19	0.50	0.89	9.72
1898.....	0.75	1.55	0.08	T.	0.55	0.00	0.00	0.00	2.10	T.	0.27	0.35	5.65
1899.....	1.01	0.17	2.02	0.19	0.10	0.85	0.00	T.	0.00	1.08	0.88	0.91	7.21
1900.....	0.97	0.16	0.89	1.94	2.41	0.00	T.	0.00	T.	0.04	3.44	0.30	10.15
Mean (12 years) .....	1.44	1.08	1.39	0.53	0.53	0.18	0.06	0.01	0.21	0.58	0.80	1.62	8.44

## POWAY, SAN DIEGO COUNTY.

[Elevation, 460 feet.]

1879.....	2.88	1.50	0.00	1.30	0.08	0.20	0.00	0.00	0.00	0.30	2.75	4.72	13.73
1880.....	1.13	1.54	1.76	3.10	0.09	0.00	0.06	0.16	T.	0.74	0.30	3.56	12.44
1881.....	1.16	0.60	2.86	1.14	0.03	0.00	0.00	0.04	0.03	1.17	0.20	0.73	7.96
1882.....	6.40	2.69	1.13	0.84	0.04	0.09	0.00	0.01	0.04	0.29	0.60	0.27	12.40
1883.....	0.88	1.76	1.87	1.36	1.34	0.00	0.00	T.	0.00	1.59	0.00	2.40	11.20
1884.....	1.59	9.40	6.96	4.81	2.28	0.44	0.00	T.	T.	0.24	0.88	5.91	31.99
1885.....	0.72	0.35	0.34	2.05	0.63	0.07	0.00	T.	0.00	0.06	2.71	0.90	7.83
1886.....	6.34	0.77	3.24	2.78	0.00	0.00	T.	0.02	0.00	0.10	1.60	0.20	14.95
1887.....	0.09	4.87	0.34	2.01	0.34	0.00	0.00	T.	0.03	0.00	2.04	2.70	13.02
1888.....	1.78	2.42	8.26	0.51	0.00	T.	0.00	0.00	0.06	0.19	1.86	2.49	17.07
1894.....	0.79	1.29	1.64	0.14	0.21	0.15	0.00	0.06	T.	T.	0.00	3.06	7.34
1895.....	12.65	1.08	1.24	0.46	0.26	0.00	0.00	T.	0.00	0.25	1.44	0.57	17.95
1896.....	2.50	T.	4.73	0.96	0.31	0.00	T.	0.08	0.00	1.51	1.54	2.42	14.05
1897.....	4.30	4.91	2.89	0.00	0.12	0.00	0.00	0.00	0.02	1.70	0.08	0.72	14.74
1898.....	2.78	0.23	1.75	0.33	1.55	0.00	0.00	T.	0.05	0.00	0.29	1.87	8.84
1899.....	2.98	0.61	1.16	0.05	0.44	0.51	0.00	0.00	0.00	0.78	1.29	1.29	9.11
1900.....	3.89	0.32	0.69	1.48	1.48	0.05	0.00	0.00	T.	0.25	3.19	0.00	11.85
Mean (17 years) .....	3.11	2.02	2.40	1.37	0.54	0.09	T.	0.02	0.05	0.54	1.16	1.99	13.29

## QUINCY, PLUMAS COUNTY.

[Elevation, 3,400 feet.]

1895.....	[3.38]	[4.96]	[6.43]	2.09	3.36	0.00	0.37	0.35	6.27	0.44	1.53	5.07	39.75
1896.....	20.79	0.65	7.96	11.03	4.39	0.00	0.06	0.20	1.43	1.05	11.26	6.36	65.13
1897.....	2.77	8.31	8.53	0.99	0.00	1.60	0.00	T.	0.63	3.01	6.13	3.97	35.94
1898.....	1.21	10.08	0.20	1.01	3.97	1.84	0.13	T.	0.06	1.73	2.47	1.56	24.23
1899.....	8.75	0.82	9.02	1.36	2.23	0.13	0.00	1.09	0.00	11.88	9.13	7.60	52.06
1900.....	6.21	1.87	7.79	3.54	0.98	0.25	T.	T.	0.04	7.33	8.42	4.70	41.63
Mean (6 years) .....	8.10	4.45	6.66	3.34	2.58	0.64	0.09	0.27	1.41	4.24	6.49	4.83	43.14

## CLIMATOLOGY OF CALIFORNIA.

## PRECIPITATION OF CALIFORNIA (INCHES AND HUNDREDTHS)—Continued.

## REDDING, SHASTA COUNTY

[Elevation, 552 feet]

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1875.....	6 21	0 16	1 41	0 01	0 14	0 24	0 00	0 00	0 00	2 11	18 81	9 13	32 72
1876.....	11 26	7 97	8 85	1 77	2 90	0 70	0 63	0 65	1 20	5 60	0 40	0 00	41 95
1877.....	6 59	3 78	4 43	0 57	1 41	0 75	0 00	0 07	0 00	1 63	7 26	4 41	30 90
1878.....	22 69	13 78	7 20	1 66	0 74	0 05	0 00	0 00	1 32	2 15	2 59	0 59	52 77
1879.....	4 20	4 81	10 54	6 82	3 56	0 48	0 03	0 11	0 00	0 75	5 96	10 85	48 11
1880.....	4 02	2 21	1 62	9 73	1 32	0 00	0 00	0 00	0 00	0 10	0 13	18 39	37 52
1881.....	14 64	9 09	0 99	5 63	0 71	1 09	0 00	0 05	1 12	4 05	1 50	6 07	44 94
1882.....	3 02	3 36	4 23	1 67	0 37	0 00	0 00	0 00	0 00	3 62	4 67	2 05	22 99
1883.....	1 78	0 36	3 71	1 56	4 26	0 00	0 00	0 00	1 00	4 09	0 67	0 75	18 18
1884.....	5 45	3 94	8 20	3 05	T	1 64	0 00	0 00	0 02	1 36	0 00	14 51	38 17
1885.....	2 32	1 28	0 00	3 63	0 00	1 23	0 00	0 00	T	0 00	11 90	9 00	29 36
1886.....	10 30	T	2 90	8 41	2 32	0 00	0 00	0 00	0 00	0 98	0 13	5 84	30 88
1887.....	2 50	8 35	1 20	3 65	1 25	0 95	0 00	0 00	0 15	0 00	1 60	4 10	23 75
1888.....	9 35	2 70	2 95	0 00	0 73	3 52	0 00	0 00	0 45	0 00	[3 68]	7 33	30 71
1889.....	[6 34]	0 09	10 78	2 33	3 90	0 96	0 00	0 00	0 00	15 13	5 07	17 66	[62 26]
1890.....	10 80	6 76	7 77	3 12	2 24	0 00	0 00	0 00	1 57	0 00	0 00	8 56	35 82
1891.....	1 68	9 95	3 05	2 31	3 17	1 91	0 75	0 00	0 13	0 02	0 08	8 36	31 41
1892.....	4 08	3 52	3 96	4 27	4 44	0 10	0 03	0 00	0 04	2 10	6 30	10 79	39 63
1893.....	4 16	3 90	12 16	4 19	1 86	0 00	T	0 00	2 36	0 39	8 33	4 16	41 51
1894.....	9 78	5 36	2 89	1 84	2 45	0 95	T	0 74	1 32	4 15	1 01	12 22	42 71
1895.....	12 84	3 08	2 78	0 99	2 61	0 00	0 95	T	3 24	0 01	2 12	4 36	32 98
1896.....	14 52	0 79	4 17	4 05	3 97	0 35	T	0 38	0 81	1 99	6 30	8 98	51 31
1897.....	4 42	6 80	5 29	3 02	0 00	1 59	T	0 00	0 15	1 36	1 69	3 60	27 92
1898.....	0 54	3 77	0 00	0 76	3 64	0 15	0 00	T	0 13	1 56	2 23	1 78	14 56
1899.....	9 66	1 04	8 86	0 61	0 82	2 46	0 00	0 08	0 00	4 38	8 50	4 18	41 04
1900.....	6 45	2 86	3 68	2 59	3 12	1 33	T	0 16	2 48	6 47	3 03	3 14	35 36
Mean (26 years).....	7 29	4 22	4 75	3 01	2 19	0 79	0 09	0 09	0 67	2 43	3 79	6 74	36 11

## REPRESSA, SACRAMENTO COUNTY

[Elevation, 305 feet]

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1893.....	[6 06]	[4 34]	7 40	2 00	1 28	0 00	0 00	0 00	0 70	0 26	3 81	2 35	[28 20]
1894.....	4 71	5 53	0 65	0 56	2 80	1 10	0 00	0 00	0 65	2 75	0 90	12 56	32 21
1895.....	11 36	2 64	2 50	2 26	1 83	0 00	0 00	T	1 45	0 07	1 98	1 95	26 04
1896.....	9 07	0 22	4 46	6 54	1 62	0 00	0 00	0 55	0 35	0 82	5 86	1 80	31 29
1897.....	4 38	8 99	4 95	0 71	0 35	T	0 00	0 18	0 10	2 61	1 11	2 04	25 42
1898.....	0 79	4 31	0 30	0 45	1 53	0 35	0 00	0 00	0 24	0 88	1 87	2 62	13 34
1899.....	5 41	0 04	7 88	0 74	1 12	0 43	0 00	0 04	0 00	6 39	5 52	4 39	31 96
1900.....	5 00	1 16	2 73	3 12	1 72	T	0 00	0 00	0 25	2 26	4 37	1 68	22 24
Mean (8 years).....	5 85	3 40	3 86	2 05	1 53	0 24	0 00	0 10	0 47	2 00	3 18	3 67	26 34

## RIO VISTA, SOLANO COUNTY

[Elevation, 28 feet.]

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1893.....	3 15	2 31	3 31	0 99	0 61	0 00	0 00	0 00	0 14	0 09	2 66	2 00	15 26
1894.....	5 61	4 56	0 65	0 35	1 23	0 98	0 03	T	1 28	1 91	0 53	8 88	25 49
1895.....	7 96	2 60	1 00	0 91	0 84	0 00	0 00	T	1 18	0 19	1 82	1 17	17 67
1896.....	9 01	0 22	1 42	4 51	0 67	0 00	T	0 21	0 53	1 44	3 12	1 96	23 09
1897.....	2 49	3 99	4 31	0 21	T	0 05	0 00	0 01	0 11	1 79	0 80	1 24	14 50
1898.....	1 26	1 89	0 29	0 28	1 55	0 06	0 00	0 00	0 17	0 70	0 45	1 47	8 12
1899.....	4 21	0 00	6 94	0 28	0 13	0 90	0 00	T	0 00	4 47	2 77	1 87	21 57
1900.....	3 02	0 42	1 46	0 94	1 39	0 10	T	0 00	0 01	1 59	4 77	1 35	15 05
Mean (8 years).....	4 59	2 00	2 42	1 06	0 80	0 26	T	0 03	0 48	1 52	2 05	2 43	17 59

## PRECIPITATION OF CALIFORNIA (INCHES AND HUNDREDTHS)—Continued.

## ROSEWOOD, TEHAMA COUNTY.

[Elevation, 885 feet.]

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1894.....	5.80	2.30	2.40	2.00	3.20	0.88	0.01	T.	1.64	1.42	0.79	12.68	33.07
1895.....	11.93	2.34	2.27	1.28	0.42	0.00	0.45	T.	0.81	0.97	1.70	8.25	25.40
1896.....	13.60	0.30	3.85	4.58	3.15	0.02	0.17	0.16	1.08	[1.05]	3.68	7.45	[39.10]
1897.....	4.49	4.64	2.17	0.42	0.01	1.77	T.	T.	0.03	1.28	1.16	2.11	18.08
1898.....	0.91	3.80	0.16	0.40	2.79	0.26	0.00	0.01	0.26	0.53	1.59	1.78	12.49
1899.....	9.50	0.30	6.09	0.90	2.09	0.02	0.00	T.	0.00	2.30	5.29	3.98	30.43
1900.....	2.98	1.91	2.37	2.42	2.60	0.70	0.00	0.08	0.59	3.46	2.71	2.77	22.59
Mean (— years) .....	7.03	2.23	2.76	1.71	2.04	0.52	0.09	0.04	0.63	1.57	2.42	4.85	25.88

## SAN ARDO, MONTEREY COUNTY.

[Elevation, 236 feet.]

1887.....	0.58	5.58	0.17	0.76	0.05	0.26	0.00	0.00	0.14	0.37	0.32	2.07	10.80
1888.....	3.44	0.28	2.91	0.11	0.27	0.00	0.00	0.00	0.00	0.00	3.24	2.31	12.56
1889.....	0.83	0.80	6.16	0.49	0.27	0.00	0.00	0.00	0.00	4.74	2.96	7.16	23.41
1890.....	3.36	3.59	0.99	0.00	0.43	0.00	0.00	0.04	1.10	0.00	0.11	1.41	11.03
1891.....	0.43	3.99	0.76	1.04	0.03	0.00	0.00	0.00	0.14	0.00	0.00	1.57	7.96
1892.....	0.58	0.48	1.37	0.08	1.61	0.00	0.00	0.00	0.00	0.15	1.80	3.40	9.47
1893.....	1.55	1.31	3.94	0.62	0.15	0.00	0.00	0.00	0.00	0.00	0.21	1.03	8.84
1894.....	1.18	0.34	0.13	0.10	0.68	0.15	0.00	0.00	0.65	0.25	0.02	4.42	7.92
1895.....	3.98	0.23	0.94	0.41	0.02	0.00	0.00	0.00	0.00	1.43	2.86	0.30	10.22
1896.....	5.10	0.00	2.11	2.27	0.25	0.00	0.00	0.22	0.00	0.45	2.73	1.54	14.67
1897.....	0.89	1.18	2.19	0.06	0.00	0.00	0.00	0.22	0.00	0.73	0.05	0.42	5.79
1898.....	0.88	0.89	0.70	0.00	0.43	0.00	0.00	T.	T.	0.13	0.20	0.15	2.88
1899.....	3.24	0.03	2.81	0.34	T.	T.	0.00	T.	0.00	1.65	0.96	1.09	10.62
1900.....	1.68	0.15	1.15	0.39	0.66	T.	T.	0.00	T.	0.88	4.30	0.08	9.29
Mean (14 years) .....	1.94	1.35	1.88	0.51	0.35	0.03	T.	0.03	0.14	0.78	1.41	1.93	10.85

## SANGER JUNCTION, FRESNO COUNTY.

[Elevation, 371 feet.]

1889.....	0.47	0.54	2.95	0.84	0.80	0.00	0.00	T.	0.00	4.39	1.31	4.71	16.00
1890.....	4.02	1.48	1.22	0.11	0.00	0.00	0.00	0.00	0.11	0.00	0.04	2.37	9.35
1891.....	0.55	2.41	0.45	0.30	0.00	0.00	0.00	0.00	0.10	0.00	0.40	3.26	7.47
1892.....	0.74	0.85	2.57	0.46	1.30	0.00	0.00	0.00	0.00	0.00	0.93	1.23	8.06
1893.....	1.15	2.15	3.14	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.17	8.92
1894.....	2.14	2.46	0.56	0.21	0.60	1.55	0.00	0.00	0.33	0.42	0.40	4.33	13.10
1895.....	4.14	2.16	2.37	0.74	0.59	0.00	0.00	0.00	0.06	0.20	0.61	0.89	11.76
1896.....	4.75	0.00	1.43	1.13	0.00	0.00	0.00	0.33	0.00	1.25	1.27	0.97	11.16
1897.....	1.94	3.97	2.32	0.46	0.00	0.00	0.00	0.00	0.00	2.22	0.55	0.66	12.12
1898.....	0.66	1.01	0.79	T.	0.77	0.00	0.00	0.00	1.44	0.03	0.23	0.33	5.26
1899.....	2.01	0.16	4.14	0.35	0.00	0.60	0.00	0.00	0.00	2.79	2.08	0.65	12.78
1900.....	2.05	0.09	1.01	0.97	1.64	0.00	0.00	0.00	0.00	0.37	5.89	0.33	12.35
Mean (12 years) .....	2.05	1.44	1.94	0.47	0.48	0.13	0.00	0.03	0.17	0.97	1.14	1.33	10.70

## SAN LEANDRO, ALAMEDA COUNTY.

[Elevation, 50 feet.]

1895.....	3.21	2.69	2.06	1.96	0.32	0.00	0.03	0.00	0.63	0.26	2.31	2.25	21.27
1896.....	9.34	0.25	2.03	5.86	0.91	0.00	0.04	1.34	0.89	1.41	5.78	2.89	31.24
1897.....	3.13	5.79	6.03	0.50	0.12	0.22	0.00	0.00	0.10	2.67	1.21	2.43	22.20
1898.....	1.33	2.66	0.39	0.38	1.44	0.36	0.00	0.00	1.13	1.43	0.96	1.58	11.66
1899.....	3.63	0.20	10.85	0.32	1.13	0.21	0.00	T.	0.00	4.38	4.76	2.76	23.84
1900.....	3.98	1.24	2.63	1.88	0.53	0.00	0.00	0.00	0.04	1.78	5.09	1.91	19.08
Mean (6 years) .....	5.02	2.14	4.00	1.96	0.84	0.13	0.02	0.22	0.46	1.99	3.35	2.30	22.33

## CLIMATOLOGY OF CALIFORNIA.

## PRECIPITATION OF CALIFORNIA (INCHES AND HUNDREDTHS)—Continued.

## SAN MIGUEL, SAN LUIS OBISPO

[Elevation, 616 feet]

Year	Jan	Feb.	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1887..	0 52	5 96	0 12	1 40	0 24	0 26	0 00	0 00	0 58	0 37	0 49	2 84	12 78
1888..	4 06	0 13	2 34	0 00	0 22	0 00	0 00	0 00	0 00	0 00	2 44	2 11	11 30
1889..	0 80	0 85	4 10	0 32	0 67	0 00	0 00	0 00	0 00	3 90	1 60	6 72	18 96
1890..	3 79	3 13	0 81	0 00	0 18	0 00	0 00	0 00	0 67	0 00	0 01	[2 50]	11 09
1891..	0 42	5 20	2 67	0 69	0 00	0 00	0 00	0 00	0 35	0 00	0 00	2 21	11 54
1892..	0 26	0 97	2 80	0 06	1 25	0 02	0 00	0 00	0 00	0 40	2 41	3 27	10 94
1893..	1 37	1 31	3 99	0 79	0 09	0 00	0 00	0 00	0 00	0 14	0 30	2 09	10 08
1894..	0 90	0 41	0 13	0 06	0 00	0 00	0 00	0 00	0 47	0 69	0 21	5 21	8 08
1895..	4 22	0 33	1 10	0 47	0 09	0 00	0 00	0 00	0 00	0 56	1 05	0 56	8 38
1896..	3 57	0 00	3 11	1 35	0 24	0 00	0 00	0 68	0 10	0 67	1 49	1 89	13 10
1897..	1 14	3 62	1 78	0 13	0 00	0 00	0 00	0 00	0 04	0 27	0 03	0 27	7 28
1898..	0 25	1 17	0 93	0 00	0 51	0 00	0 00	0 00	0 02	0 03	0 19	0 36	3 46
1899..	3 09	0 26	3 04	0 99	0 00	0 17	0 00	0 00	0 00	2 35	0 87	1 23	12 00
1900..	1 69	0 07	1 63	0 44	0 45	0 00	0 00	0 00	0 00	0 60	4 45	0 12	9 45
Mean (14 years)	1 86	1 67	2 00	0 48	0 28	0 03	0 00	0 05	0 16	0 71	1 11	2 24	10.60

## SAN MIGUEL ISLAND, SANTA BARBARA COUNTY

[Elevation, 500 feet]

1894..	[3 90]	[1 07]	0 40	0 34	0 34	0 11	T	0 00	0 79	0 11	0 80	4 80	12 16
1895..	4 10	0 63	2 12	0 10	0 05	0 00	0 00	0 00	0 00	1 27	0 40	0 48	9 15
1896..	5 37	0 00	2 25	0 93	0 90	0 00	0 16	0 10	0 21	0 60	2 52	1 36	14 40
1897..	4 28	3 57	1 63	0 04	0 03	0 00	0 00	0 00	0 18	0 76	0 00	0 14	10 63
1898..	1 84	0 09	0 39	0 02	0 71	0 70	0 14	0 04	2 70	0 23	0 20	1 16	8 22
1899..	4 25	0 35	1 89	1 33	[0 41]	2 00	0 00	0 00	0 00	1 40	1 56	[1 35]	14 54
1900..	1 76	0 24	0 75	0 75	0 44	0 00	0 00	0 00	0 00	0 24	1 70	0 17	6 05
Means (7 years)	3 64	0 65	1.35	0 50	0 41	0 40	0 04	0 02	0.55	0 66	0 95	1 35	10 94

## SANTA ANA, ORANGE COUNTY.

[Elevation, 137 feet]

1889..	0 31	2 07	4 65	0 66	0 45	0 00	0 00	0 66	0 00	1 88	0 36	12 09	23 13
1890..	4 75	1 66	3 22	0 00	0 35	0 00	0 00	0 00	0 25	0 00	0 30	2 35	12 88
1891..	0 20	3 70	0 69	0 37	0 00	0 00	0 00	0 00	0 00	0 00	0 00	1 66	11 62
1892..	1 23	2 26	0 86	0 25	1 92	0 00	0 00	0 00	0 00	0 16	1 14	1 46	9 28
1893..	2 50	2 46	5 93	0 30	0 00	0 00	0 00	0 00	0 00	2 14	0 41	2 20	15 94
1894..	0 50	0 50	0 63	0 10	0 13	0 00	0 00	0 00	0 22	0 00	0 00	4 98	7 06
1895..	7 10	0 90	2 96	0 60	0 10	0 00	0 00	0 00	0 00	0 00	0 80	0 70	13 16
1896..	3 43	0 00	2 90	[0 25]	0 00	0 00	0 00	0 00	0 00	1 88	1 45	2 27	11 68
1897..	2 19	4 71	2 15	0 00	0 13	0 00	0 00	0 00	0 00	1 30	0 00	0 00	10 48
1898..	0 91	1 39	0 90	0 00	0 37	0 00	0 00	0 00	0 00	0 00	0 00	0 50	4 07
1899..	3 25	0 20	1 24	0 25	0 00	0 55	0 00	0 00	0 42	1 90	0 68	1 20	9 69
1900..	1 67	0 20	0 77	1 02	1 00	0 00	0 00	0 00	0 00	0 15	3 72	0 00	8 53
Means (12 years)	2 34	2 09	2 24	0 32	0 37	0 05	0 00	0 06	0 07	0 74	0 74	2 45	11 46

## PRECIPITATION OF CALIFORNIA (INCHES AND HUNDREDTHS)—Continued.

## SANTA CLARA, SANTA CLARA COUNTY.

[Elevation, 88 feet.]

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1881.....	2.69	2.33	0.88	1.08	0.00	0.30	0.00	0.00	0.00	0.18	1.12	1.77	10.85
1882.....	1.25	1.50	4.96	1.15	0.25	0.00	0.00	0.00	0.12	1.18	1.29	1.68	18.88
1883.....	0.55	0.72	2.74	0.60	2.37	0.00	0.00	0.00	0.05	0.70	0.48	0.70	8.19
1884.....	4.10	3.99	5.80	2.90	0.00	1.65	0.00	0.05	0.00	1.88	0.05	4.32	24.74
1885.....	1.45	0.25	0.65	1.77	0.00	0.00	0.00	0.00	0.01	0.06	7.58	3.03	14.80
1886.....													
1887.....	3.56	6.94	0.70	1.22	0.00	0.00	0.00	0.00	0.41	0.40	0.69	2.45	16.37
1888.....	3.08	1.68	3.10	0.12	1.28	0.18	0.00	0.00	0.58	0.00	4.37	3.00	17.39
1889.....	0.58	0.48	5.82	0.74	0.91	0.01	0.00	0.00	0.00	4.84	2.01	10.78	26.21
1890.....	7.02	3.85	1.99	0.47	0.73	0.00	0.00	0.00	0.10	0.00	0.07	2.07	15.80
1891.....	0.46	6.55	2.16	2.43	0.17	0.05	0.00	0.00	0.25	0.00	0.43	5.39	17.89
1892.....	0.94	1.44	3.42	0.54	1.02	0.06	0.00	0.00	0.00	1.19	4.12	7.75	21.08
1893.....	3.07	2.83	4.79	1.46	0.38	0.02	0.00	0.00	T.	0.04	0.83	1.16	15.03
1894.....	4.64	2.16	0.45	0.49	1.10	0.88	T.	T.	0.99	2.07	0.55	7.58	20.41
1895.....	5.93	1.24	2.03	1.94	0.98	0.00	0.00	0.00	0.15	0.49	1.17	0.77	14.70
1896.....	0.02	0.20	2.08	2.72	0.32	0.00	0.00	0.69	0.19	1.47	3.13	2.69	19.51
1897.....	1.20	3.94	3.51	0.15	0.05	0.00	0.00	0.00	0.08	1.04	0.56	1.29	11.82
1898.....	1.23	2.12	0.60	0.16	0.65	0.08	0.00	0.00	1.34	0.68	0.36	0.86	8.13
1899.....	2.08	0.27	4.02	0.51	0.19	0.38	0.00	0.00	0.00	3.69	2.23	1.59	15.56
1900.....	2.54	0.49	1.10	1.09	0.77	0.05	0.00	0.00	0.21	1.02	4.50	1.38	13.15
Means (19 years).....	2.79	2.24	2.67	1.13	0.62	0.17	T.	0.04	0.24	1.10	1.87	3.20	16.06

## SANTA MARGARITA, SAN LUIS OBISPO COUNTY.

[Elevation, 995 feet.]

1889.....	[5.27]	0.11	8.87	0.03	2.14	0.00	0.00	0.00	0.00	10.85	3.20	15.68	46.15
1890.....	8.53	7.72	3.49	0.00	0.32	0.00	0.00	0.00	0.85	0.00	0.00	5.68	26.59
1891.....	0.97	10.96	3.13	1.80	0.33	0.00	0.00	0.00	0.71	0.00	0.06	8.21	26.22
1892.....	1.54	2.19	4.49	0.67	2.65	0.00	0.00	0.00	0.00	0.30	7.40	8.15	27.39
1893.....	4.50	9.05	10.60	1.08	0.00	0.00	0.00	0.00	0.00	0.70	0.00	2.60	29.13
1894.....	2.99	3.21	0.50	0.85	2.10	0.00	0.00	0.00	2.22	0.73	0.33	10.82	23.75
1895.....	13.57	2.16	2.66	1.52	0.57	0.00	0.00	0.00	T.	1.05	2.25	0.77	24.55
1896.....	11.18	0.10	5.07	5.25	0.20	0.00	0.18	0.19	0.00	2.00	2.85	4.08	31.10
1897.....	3.07	8.04	6.00	0.20	0.00	0.00	0.00	0.00	0.00	0.90	0.05	0.78	19.63
1898.....	1.11	2.94	1.13	0.00	1.53	0.00	0.00	0.00	0.18	0.18	0.05	0.55	7.67
1899.....	5.62	0.20	9.70	1.79	0.00	0.86	0.00	0.00	0.00	4.19	2.15	3.90	28.47
1900.....	3.27	0.02	4.00	1.25	0.84	0.00	0.00	0.00	0.12	1.50	13.54	0.68	25.22
Means (12 years).....	5.14	3.90	5.02	1.25	0.89	0.07	0.02	0.02	0.34	1.87	2.67	5.16	26.33

## SANTA MARIA, SANTA BARBARA COUNTY.

[Elevation, 220 feet.]

1886.....	1.33	0.97	2.55	3.87	0.00	0.00	0.00	0.00	0.00	0.06	0.59	0.72	10.09
1887.....	0.50	5.95	0.25	1.07	0.22	T.	0.00	0.00	0.30	0.40	1.09	2.69	12.47
1888.....	4.62	0.43	1.98	0.12	0.14	T.	T.	0.00	T.	0.00	2.59	5.86	15.74
1889.....	0.42	1.35	4.20	0.97	0.60	0.05	0.00	0.00	0.00	7.53	1.80	6.71	23.63
1890.....	7.02	3.64	0.88	0.10	0.13	0.00	0.06	0.00	0.55	0.70	0.70	3.40	17.13
1891.....	0.63	3.57	0.71	1.58	0.20	0.00	0.00	0.00	0.08	0.00	0.33	2.77	9.32
1892.....	0.56	2.18	2.36	0.45	1.15	T.	0.00	0.00	0.00	0.35	1.95	2.52	11.52
1893.....	2.08	3.10	6.34	0.80	0.05	0.00	0.00	0.00	9.00	0.65	0.22	2.95	16.69
1894.....	1.16	1.78	0.62	0.25	0.73	0.16	0.06	T.	1.05	0.63	0.07	3.36	10.42
1895.....	4.43	1.22	1.25	0.53	0.51	0.00	T.	0.00	0.01	0.65	1.26	0.60	10.46
1896.....	4.60	0.00	2.59	1.77	0.03	0.00	0.11	0.03	0.02	0.60	1.32	2.34	13.31
1897.....	3.55	4.00	2.52	0.14	0.01	0.00	0.03	0.00	0.10	0.67	0.03	0.55	11.60
1898.....	1.44	1.06	0.65	0.02	1.14	0.00	0.00	0.00	0.96	0.30	0.05	0.64	6.26
1899.....	3.49	0.46	4.88	0.99	0.75	0.00	0.00	0.00	0.00	1.86	1.21	0.39	14.53
1900.....	0.87	0.05	1.41	0.97	1.97	T.	T.	T.	T.	0.65	5.40	0.35	11.67
Means (15 years).....	2.43	1.98	2.25	0.83	0.51	0.01	0.02	T.	0.20	1.01	1.27	2.46	13.07

## CLIMATOLOGY OF CALIFORNIA.

## PRECIPITATION OF CALIFORNIA (INCHES AND HUNDREDTHS)—Continued.

SANTA PAULA, MONTEREY COUNTY

[Elevation, 286 feet]

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual.
1889.	0 65	1.02	9 00	0 36	0 30	0 00	0 00	0 01	0 00	6 28	1 81	16 45	85 88
1890.	5 40	2 00	0 47	0 05	0 00	0 00	0 00	0 00	0 72	0 00	0 34	2 53	11 61
1891.	0 48	8 73	2 40	0 82	0 13	0 00	0 00	0 00	0 19	0 00	0 00	1 54	14 29
1892.	0 70	3 99	3 24	0 54	1 80	0 00	0 00	0 00	0 00	[1 08]	0 00	6 58	17 93
1893	4 60	2.81	6 81	0 40	0 00	0 00	0 00	0 00	0 00	0 87	0 00	3 64	19 13
1894.	1 04	0 00	0 00	0 23	0 46	0 00	0 10	0 00	0 98	0 30	0 00	5 45	8 56
1895.	6 90	0 60	3 13	0 30	0 00	0 00	0 10	0 00	0 00	0 14	0.90	0 85	12 82
1896.	5 66	0 00	3 18	1 00	0 00	0.00	0.00	0.10	0 00	0 97	1 43	3.13	15 47
1897.	5 31	4 98	3 24	0 00	0 00	0.00	0 00	0 00	0 45	1 07	0 00	0 00	15 05
1898.	0 92	0 70	1 55	0 00	1 10	0 00	0 00	0 00	0 86	0 08	T	0 27	5 48
1899.	3 44	0 00	2 41	0 35	0 00	0 59	0 00	0 00	0 00	1 84	1 17	1 66	11 46
1900.	1 67	0 00	1 36	0 38	1 49	0 00	0 00	T	0 00	0 07	4 71	T	9 68
Means (12 years) .....	3 06	2 07	3 07	0 37	0 44	0 05	0 01	0 01	0 27	1 06	0.86	3 51	14 77

SANTA ROSA, SONOMA COUNTY

[Elevation, 181 feet]

1889	1.77	0.35	7.92	1.09	2.98	0.25	0.00	0.00	0.00	8.78	4.39	15.94	43.42
1890	12.84	4.74	6.15	1.82	1.40	0.00	0.00	0.00	0.20	0.00	0.00	3.98	31.08
1891	1.25	10.49	1.22	2.39	1.28	0.00	0.75	0.00	0.20	0.20	1.50	8.64	27.87
1892	3.43	5.07	4.14	2.65	3.78	0.00	0.00	0.00	0.00	1.44	3.87	6.55	30.43
1893	4.13	5.56	6.59	2.07	0.80	0.00	0.00	0.00	0.25	0.52	4.82	2.61	27.35
1894	9.61	3.78	1.81	1.08	1.84	1.80	0.00	0.00	1.50	2.55	0.89	13.41	37.00
1895	18.42	3.35	2.94	1.35	1.39	0.00	0.33	0.00	[0.37]	0.00	1.88	2.95	82.93
1896	10.57	0.69	3.58	4.70	1.45	0.00	0.00	0.00	0.48	1.50	5.09	6.42	34.41
1897	2.27	6.25	5.50	1.03	0.57	0.83	0.00	0.00	0.10	1.88	2.18	[6.82]	27.43
1898	1.81	5.32	0.66	0.38	3.32	0.17	0.00	0.00	0.62	1.07	1.16	1.20	15.71
1899	8.77	0.00	8.57	0.67	2.09	0.00	0.00	0.15	0.00	5.94	5.44	4.78	36.41
1900	4.98	0.77	3.72	2.33	0.60	0.16	0.00	0.00	0.00	4.41	5.60	3.35	26.42
Means (12 years)	6.65	3.86	4.35	1.84	1.78	0.23	0.09	0.01	0.31	2.86	3.02	6.36	30.87

**SELMA**

[Elevation, 311 feet ]

1886.....	1 97	0 36	0 96	1 98	0 00	0 00	0 00	0 00	0 00	0 27	0 59	0 60	6 78
1887.....	0 81	2 84	0 00	2 60	0 58	0 00	0 00	0 00	0 00	0 20	0 16	0 97	7 66
1888.....	2 40	T	1 57	0 10	0 31	0 00	0 00	0 00	0 10	0 00	1 46	1 88	7 82
1889.....	0 36	0 53	1 85	0 47	0 70	0 00	0 00	0 00	0 00	3 60	1 09	3 98	12.58
1890.....	2 19	0 94	1 19	0 25	1 19	0 00	0 00	0 00	0 95	0 00	0 50	1 89	9 10
1891.....	0 48	2 20	0 47	0 47	0 00	0 00	0 00	0 00	0 07	0 00	0 45	2 63	6 77
1892.....	0 31	1 27	1 57	0 80	0 38	0 00	0 00	0 00	0 00	0 45	0 80	1 17	6 75
1893.....	1 08	1 60	3 32	0 23	0 00	0 00	0 00	0 00	0 00	0 00	0 01	1 58	7 82
1894.....	1 51	1 21	0 40	0 08	0 22	0 90	0 00	0 00	0 40	0 35	0 05	3 35	8 47
1895.....	3 53	1 42	1 15	0 40	0 30	0 00	0 00	0 00	0 00	0 00	1 00	0 55	8 35
1896.....	2 52	0 00	1 15	1 13	0 32	0 00	0 00	0 05	0 00	1 00	2 35	0 75	9.27
1897.....	1 49	[1 11]	1 56	0 47	0 00	0 00	0 00	0 00	0 00	1 15	0 14	0 47	6 39
1898.....	0 27	0 93	0 30	0 00	0 70	0 00	0 00	0 00	1 33	T	0 10	0 28	3 91
1899.....	1 75	T	3 27	0 18	0 00	0 00	0 00	0 00	0 00	2 70	0 92	0 85	9 67
1900.....	1 81	0 00	0 90	0 95	1 21	0 00	0 00	0 00	0 00	T	3.54	0 39	8.80
Mean (15 years) .....	1 47	0 96	1 81	0 67	0 39	0 06	0 00	T.	0 19	0 65	0 88	1 42	8 01

## SHASTA, SHASTA COUNTY

[Elevation, 1,148 feet ]

1896	27.67	0.69	6.93	12.27	9.17	0.27	0.00	0.43	1.06	3.92	10.17	13.10	85.68
1897	6.95	9.89	7.18	0.78	0.01	2.23	0.00	0.00	0.07	2.66	2.20	4.81	36.28
1898	0.84	8.39	T	0.56	6.22	0.12	0.00	T	T	0.67	2.89	2.15	21.84
1899	12.42	1.20	10.15	1.41	2.34	1.96	0.00	0.06	0.00	5.39	11.29	6.38	52.60
1900	6.69	3.99	6.81	7.47	3.00	1.85	T	0.21	3.43	8.91	5.82	7.45	55.63
1901	13.65	8.43	1.46	5.51	0.39	0.00	---	---	---	---	---	---	---
Mean (6 years)	11.29	5.85	5.42	4.67	3.52	1.07	---	---	---	---	---	---	---

## PRECIPITATION OF CALIFORNIA (INCHES AND HUNDREDTHS)—Continued.

## SIERRA MADRE, LOS ANGELES COUNTY.

[Elevation, 1,400 feet.]

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1897.....	4.48	8.60	4.08	0.10	0.45	0.06	0.06	0.00	0.42	3.46	0.32	0.69	22.72
1898.....	1.68	0.41	1.23	0.90	2.42	0.00	0.00	0.00	T.	T.	T.	1.63	8.22
1899.....	3.21	0.12	2.77	T.	0.25	1.56	0.00	0.10	0.01	2.50	1.73	1.01	13.56
1900.....	1.26	0.02	1.92	1.09	2.84	0.10	T.	0.00	0.06	0.58	10.96	0.00	13.83
1901.....	4.84	8.63	1.14	1.50	2.51	0.43							
Mean (5 years).....	3.08	3.56	2.23	0.72	1.69	0.43							

## SISSON, SISKIYOU COUNTY.

[Elevation, 3,555 feet.]

1889.....	0.60	0.40	16.27	0.63	2.40	0.23	0.00	0.00	0.00	16.45	5.80	16.13	58.91
1890.....	12.99	9.33	5.30	2.98	2.75	1.74	0.00	0.00	1.20	0.13	0.00	3.13	39.60
1891.....	0.40	7.17	0.61	3.64	2.65	[0.66]	[0.06]	0.00	0.32	0.30	0.35	11.20	27.36
1892.....	2.34	0.66	4.19	5.38	3.74	0.39	0.00	0.00	1.71	1.08	3.75	9.57	37.76
1893.....	3.10	2.80	2.77	10.60	2.66	0.03	0.00	0.00	0.68	0.61	4.25	2.87	30.37
1894.....	10.72	2.60	3.45	0.70	2.85	2.25	0.00	0.00	[0.95]	3.65	1.70	11.13	40.00
1895.....	9.12	1.22	3.62	1.27	2.05	0.00	0.55	0.00	4.65	0.00	0.70	4.31	27.49
1896.....	19.19	0.21	2.26	3.55	3.02	0.14	0.00	0.31	0.00	1.29	6.68	13.70	50.35
1897.....	2.59	4.86	0.43	0.53	0.00	0.15	0.00	0.00	0.00	2.81	2.62	3.72	17.21
1898.....	1.00	10.45	0.00	1.05	6.13	1.03	0.00	0.00	0.00	0.00	1.70	2.10	23.46
1899.....	5.55	1.03	2.98	0.23	1.49	0.89	0.00	1.32	0.00	4.01	10.33	5.87	34.00
1900.....	8.64	1.04	9.92	3.49	2.05	1.24	0.00	0.16	0.67	10.76	4.52	3.80	46.29
Mean (12 years).....	6.35	3.43	4.32	2.84	2.65	0.73	0.05	0.15	0.85	3.33	3.99	17.23	36.07

## SOLEDAD, MONTEREY COUNTY.

[Elevation, 188 feet.]

1874.....	1.62	0.32	1.73	0.40	0.23	0.00	0.00	0.00	0.00	0.15	0.13	0.00	4.58
1875.....	4.09	0.20	0.40	0.04	0.00	0.00	0.00	0.00	0.00	0.00	2.80	0.59	8.12
1876.....	5.26	3.45	3.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	12.15
1877.....	0.87	0.25	0.28	1.05	0.00	0.00	0.00	0.00	0.00	0.00	0.95	1.48	4.83
1878.....	3.69	4.63	0.73	0.74	0.00	0.00	0.00	0.00	0.00	0.08	0.05	1.44	11.34
1879.....	0.63	0.34	1.04	0.59	0.00	0.00	0.00	0.00	0.00	0.45	0.47	1.57	5.09
1880.....	0.55	1.05	0.87	2.19	0.23	0.00	0.00	0.00	0.00	0.00	0.13	3.14	8.21
1881.....	1.52	0.61	1.14	0.09	0.00	0.10	0.00	0.00	0.04	0.07	0.56	0.79	4.92
1882.....	0.96	1.92	4.65	0.26	0.49	0.00	0.00	0.00	0.00	0.46	1.08	0.25	10.07
1883.....	2.68	0.59	1.72	0.60	1.26	0.00	0.00	0.00	0.08	0.48	0.17	0.45	8.03
1884.....	2.74	4.24	3.74	1.67	1.13	1.56	0.00	0.10	0.00	1.78	0.30	1.74	19.00
1885.....	0.92	0.00	0.47	0.58	0.00	0.00	0.00	0.00	0.00	0.20	6.22	1.02	9.41
1886.....	2.44	0.93	1.09	1.93	0.00	0.00	0.02	0.00	0.00	0.32	1.04	0.15	8.52
1887.....	0.34	3.94	0.41	0.54	0.00	0.00	0.00	0.00	0.16	0.00	0.51	1.47	7.37
1888.....	2.86	0.55	2.10	0.15	0.35	0.00	0.00	0.00	0.25	0.00	2.03	1.73	10.02
1889.....	0.69	1.75	3.35	0.30	0.53	0.00	0.00	0.00	0.00	3.00	0.27	8.94	18.33
1890.....	3.79	2.53	0.37	0.00	0.04	0.00	0.00	0.00	0.65	0.00	0.27	1.94	9.59
1891.....	0.31	2.43	0.42	1.40	0.08	0.00	0.00	0.00	0.01	0.20	0.00	3.10	7.95
1892.....	0.20	1.47	2.03	0.29	0.85	0.00	0.00	0.00	0.05	0.75	1.70	2.97	10.31
1893.....	0.39	1.33	3.03	0.31	0.39	0.00	0.00	0.00	0.00	0.00	0.17	1.14	7.36
1894.....	2.05	0.60	0.40	0.22	0.62	0.00	0.00	0.00	0.79	0.71	0.20	2.73	8.32
1895.....	4.16	0.72	0.85	0.50	0.13	0.00	0.00	0.00	0.00	1.32	0.96	0.45	9.14
1896.....	3.32	0.00	1.19	1.66	0.05	0.00	0.00	0.03	0.00	0.59	1.74	1.16	9.74
1897.....	0.39	2.36	2.29	0.15	0.00	0.00	0.00	0.00	0.04	0.65	0.92	0.40	7.70
1898.....	0.52	0.70	0.52	0.06	0.42	0.03	0.00	0.00	0.03	0.00	0.27	0.30	2.35
1899.....	2.42	0.39	1.30	0.63	0.00	0.00	0.00	0.00	0.00	1.64	0.35	1.11	8.39
1900.....	1.37	0.20	0.37	0.74	0.40	0.00	T.	0.00	0.00	0.64	5.62	0.35	9.69
Mean (27 years).....	1.90	1.41	1.50	0.65	0.27	0.06	T.	T.	0.08	0.50	1.09	1.50	8.97

## CLIMATOLOGY OF CALIFORNIA.

## PRECIPITATION OF CALIFORNIA (INCHES AND HUNDREDTHS)—Continued

## SONOMA, SONOMA COUNTY

[Elevation, 30 feet ]

Year	Jan	Feb	Mar	Apr	May	June.	July	Aug	Sept	Oct	Nov	Dec	Annual
1886 . . . . .	7 84	0 28	1 38	7 09	0 29	0 00	0 00	0 00	T	0 95	0 27	2 36	20 46
1887. . . . .	1 94	11 77	0 98	2 58	T	0 00	0 00	0 00	0 25	0 00	2 08	4 97	24 47
1888 . . . . .	5 78	0 70	4 55	0 19	1 42	0 73	0 01	0 00	0 86	0 00	5 02	8 30	27 56
1889 . . . . .	0 90	0 79	3 02	2 17	1 16	0 21	0 03	T	0 33	9 09	4 36	11 47	33 53
1890. . . . .	6 02	12 86	6 16	1 80	1 12	T	0 00	0 04	0 23	0 03	0 00	3 73	31 99
1891. . . . .	1 40	10 03	2 43	2 71	1 42	0 18	0 26	0 00	0 45	0 20	0 90	8 01	27 99
1892. . . . .	2 61	3 57	3 04	2 01	2 55	0 00	0 00	T	T	1 37	6 46	7 97	29 58
1893. . . . .	4 68	3 33	6 78	1 89	0 60	0 00	0 00	0 00	0 50	0 27	5 30	2 93	26 48
1894 . . . . .	10 39	3 96	1 47	1 00	1 40	0 75	0 00	T	0 33	1 42	2 81	5 64	29 17
1898 . . . . .	4 62	5 28	0 47	0 35	1 68	0 27	0 00	0 00	0 36	0 89	0 91	0 99	15 82
1899 . . . . .	7 76	0 34	6 85	1 30	1 32	0 09	0 00	0 05	0 00	6 27	4 75	4 23	32 96
1900. . . . .	4 68	1 21	2 66	1 59	0 47	0 18	0 00	0 00	0 12	2 54	4 60	2 52	20 57
Mean (12 years) . . . . .	4 88	4 53	3 31	2 05	1 12	0 20	0 02	0 01	0 29	1 92	3 12	5 26	26 72

## SUISUN, SOLANO COUNTY

[Elevation, 20 feet ]

Year	Jan	Feb	Mar	Apr	May	June.	July	Aug	Sept	Oct	Nov	Dec	Annual
1881. . . . .	7 17	3 46	1 06	1 41	0 10	0 50	0 79	0 00	0 31	0 73	1 27	4 28	21 08
1882. . . . .	1 78	2 53	2 57	1 53	0 14	0 00	0 00	0 00	0 00	2 43	2 82	0 57	14 37
1883. . . . .	1 35	0 85	4 35	0 88	3 82	0 20	0 00	0 00	0 58	0 15	0 52	0 70	13 40
1884. . . . .	2 64	4 43	6 33	3 78	0 30	1 69	0 00	0 00	T	0 70	0 00	7 46	27 38
1885. . . . .	1 06	1 25	0 64	1 52	0 02	0 00	0 00	0 00	0 05	0 22	10 38	4 43	19 57
1886. . . . .	8 18	T	1 87	4 02	0 15	0 00	0 00	0 00	0 00	0 49	0 22	1 80	16 73
1887. . . . .	0 82	6 07	0 85	1 74	0 00	0 00	0 00	0 00	0 00	0 00	0 96	2 79	13 23
1888. . . . .	4 28	1 58	3 97	0 00	0 65	0 30	0 00	0 00	0 70	0 00	3 88	4 48	19 84
1889 . . . . .	0 50	0 85	5 65	0 43	1 47	0 00	0 00	0 00	0 00	6 47	3 27	10 18	28 82
1890. . . . .	7 38	4 50	5 46	1 10	1 02	0 00	0 00	0 00	0 33	0 00	0 00	2 81	22 60
1891. . . . .	0 76	8 99	1 00	2 85	0 94	0 00	0 00	0 00	1 06	0 00	0 27	6 69	22 56
1892. . . . .	1 73	2 93	2 05	2 09	2 52	0 00	0 00	0 00	0 00	1 18	3 53	7 06	23 14
1893. . . . .	4 19	2 27	3 51	0 72	0 16	0 00	0 00	0 00	1 11	0 74	2 76	2 06	17 52
1894 . . . . .	6 33	2 29	0 83	0 41	1 85	0 77	0 00	0 00	0 95	1 28	0 53	9 53	21 82
1895. . . . .	8 14	2 69	1 50	1 07	0 66	0 00	0 00	0 00	0 64	T	1 73	1 26	17 69
1896 . . . . .	9 57	0 11	3 04	5 53	0 95	0 00	0 00	0 56	0 34	1 44	5 29	2 93	24 70
1897 . . . . .	2 47	5 16	4 21	0 43	0 03	0 08	0 00	0 00	0 03	2 86	0 69	2 09	18 05
1898 . . . . .	1 42	2 18	0 14	0 32	1 38	0 27	0 00	0 00	0 46	0 88	0 30	1 44	8 79
1899 . . . . .	5 34	0 00	7 70	0 47	0 07	0 71	0 00	0 20	0 00	2 57	3 13	3 52	23 78
1900 . . . . .	4 00	0 53	1 55	1 48	0 35	0 02	0 00	0 00	0 02	0 65	4 66	1 67	14 93
Mean (20 years) . . . . .	3 96	2 64	2 92	1 59	0 83	0 23	0 04	0 33	1 14	2 31	3 89	5 89	19 90

## SUMMERDALE, MARIPOSA COUNTY

[Elevation, 5,270 feet.]

Year	Jan	Feb	Mar	Apr	May	June.	July	Aug	Sept	Oct	Nov	Dec	Annual
1896. . . . .	21 56	0 40	6 39	9 21	1 45	0 00	0 38	1 38	1 28	2 53	9 66	4 56	58 80
1897. . . . .	4 42	17 66	11 35	1 13	0 23	0 63	0 00	0 00	0 08	5 02	2 80	4 57	47 84
1898. . . . .	2 60	7 25	3 36	0 53	3 18	0 00	0 00	0 00	1 93	1 20	1 64	2 64	24 33
1899 . . . . .	7 96	1 24	18 66	1 70	0 99	1 79	0 00	0 02	0 00	7 11	7 25	13 63	60 35
1900. . . . .	7 05	0 72	6 36	5 50	1 87	0 07	0 00	T	0 75	9 57	18 91	1 79	52 59
Mean (5 years) . . . . .	8 72	5 45	9 22	3 61	1 55	0 50	0 08	0 28	0 81	5 09	8 05	5 44	48 78



## GENERAL PRECIPITATION TABLES.

205

## PRECIPITATION OF CALIFORNIA (INCHES AND HUNDREDTHS)—Continued.

## SUMMIT, PLACER COUNTY.

[Elevation, 1,770 feet.]

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1871.....	7.60	7.55	4.05	4.00	0.81	0.89	0.00	0.00	0.30	0.40	8.50	27.00	60.60
1872.....	4.00	16.10	5.90	5.60	0.30	0.00	0.00	0.00	0.00	0.00	0.00	6.00	37.90
1873.....	2.31	16.20	6.05	2.55	2.11	0.00	0.03	T.	0.00	0.00	0.00	11.70	40.95
1874.....	5.00	0.00	0.00	2.00	3.60	T.	0.00	0.00	0.00	3.80	3.60	0.85	18.85
1875.....	8.15	0.12	4.80	0.80	1.46	2.55	T.	0.00	0.00	[2.28]	6.50	7.25	[38.86]
1876.....	14.65	8.70	13.80	2.60	1.60	T.	1.21	0.10	0.56	2.98	0.50	0.20	46.90
1877.....	8.90	0.69	3.44	4.84	3.75	0.12	0.00	0.00	0.30	0.55	3.34	0.80	26.73
1878.....	10.00	11.50	3.05	2.40	1.60	0.00	0.00	0.09	0.44	1.21	0.80	1.60	32.69
1879.....	13.65	8.70	21.05	4.52	2.55	0.10	0.00	T.	0.00	4.20	5.60	13.30	73.87
1880.....	6.60	7.50	8.90	30.40	3.60	0.00	0.80	0.00	0.00	0.00	0.50	6.20	64.50
1881.....	7.50	4.60	1.50	1.00	0.05	0.50	0.00	0.00	0.60	3.10	3.05	9.05	30.95
1882.....	7.40	9.00	19.30	3.25	0.60	0.00	0.00	0.00	0.75	12.95	3.95	4.92	62.12
1883.....	1.00	2.60	7.70	3.40	3.42	0.00	0.00	0.00	0.10	0.95	1.20	3.20	28.57
1884.....	7.60	12.70	9.10	12.60	0.80	4.04	0.00	0.00	1.10	3.13	0.00	9.40	60.47
1885.....	1.40	0.58	0.10	4.88	1.00	0.80	0.00	T.	0.05	0.00	13.60	3.00	25.41
1886.....	13.90	1.40	7.80	6.40	0.95	0.00	0.00	0.00	0.00	3.10	1.70	5.75	41.00
1887.....	6.25	20.70	1.40	5.80	0.95	1.60	0.10	T.	T.	0.07	1.50	11.60	49.97
1888.....	9.20	1.29	8.05	2.30	1.04	3.72	3.51	0.23	0.00	0.00	1.90	5.26	36.55
1889.....	1.00	1.50	9.55	1.90	6.30	0.22	0.00	0.00	0.00	5.65	6.80	13.50	51.42
1890.....	19.20	11.60	14.00	2.60	0.25	0.00	0.00	0.00	0.00	0.00	0.00	7.40	55.05
1891.....	1.50	1.38	5.10	4.60	1.10	0.00	0.00	0.00	[0.20]	0.05	0.30	11.90	26.18
1892.....	4.00	3.40	7.40	4.50	6.30	0.20	0.00	0.00	0.00	0.60	8.80	9.50	44.70
1893.....	7.90	10.80	14.50	9.20	0.00	0.00	0.00	0.00	0.00	0.30	3.60	6.00	52.30
1894.....	15.50	15.25	3.40	4.30	2.40	0.00	0.00	0.00	0.50	2.30	1.00	24.50	69.75
1895.....	25.80	4.20	4.70	2.50	2.40	0.00	0.00	0.00	0.20	0.00	1.40	8.30	49.50
1896.....	10.50	0.70	9.70	13.20	5.40	0.00	[0.21]	[0.02]	0.40	0.90	12.30	4.10	62.43
1897.....	4.05	14.35	18.00	1.25	0.00	0.70	0.00	0.00	0.08	2.50	26.50	4.20	71.58
1898.....	4.00	7.10	5.20	0.80	2.90	0.90	0.00	0.00	0.00	4.40	2.50	3.60	31.40
1899.....	12.70	5.20	15.75	1.75	3.60	0.70	0.00	1.00	0.00	16.05	9.15	7.90	73.80
1900.....	5.25	4.75	8.15	4.80	3.97	0.50	0.25	T.	0.95	3.50	6.90	3.50	42.52
Mean (30 years) .....	8.22	7.01	8.05	5.19	2.14	0.58	0.20	0.50	0.22	2.52	4.52	7.88	46.58

## SUSANVILLE, LASSEN COUNTY.

[Elevation, 4,195 feet.]

1889.....	0.03	0.60	4.81	1.07	6.26	1.55	0.05	0.00	0.00	4.18	2.74	8.55	29.34
1890.....	3.72	4.71	4.60	1.06	1.51	0.14	0.00	0.15	0.15	T.	0.35	3.47	24.86
1891.....	1.00	7.84	2.49	0.80	2.41	1.65	0.55	T.	0.65	0.45	1.10	4.91	23.85
1892.....	1.77	2.96	2.80	2.80	1.35	0.98	0.00	0.00	[0.86]	0.33	10.66	6.80	31.81
1893.....	4.82	3.53	1.55	1.33	0.67	0.00	T.	T.	1.65	0.60	1.80	0.95	17.40
1894.....	6.10	3.53	2.35	0.95	1.55	0.75	0.00	0.20	0.30	1.96	0.40	8.66	26.75
1895.....	10.29	3.00	1.26	0.50	1.50	T.	T.	0.20	3.00	0.10	1.95	2.91	24.71
1896.....	6.94	0.05	3.23	5.10	2.22	T.	0.20	0.20	1.33	0.50	3.88	2.96	26.61
1897.....	5.99	4.25	2.66	0.30	0.90	0.42	0.00	0.08	0.55	2.45	3.13	2.22	22.95
1898.....	0.45	2.38	0.35	0.24	0.54	1.02	0.00	0.08	0.10	0.80	1.74	0.65	8.35
1899.....	2.90	0.31	3.32	0.92	1.42	0.00	0.00	0.46	0.00	5.21	2.70	3.59	20.38
1900.....	1.50	1.22	2.97	0.90	0.64	0.40	0.63	0.02	0.25	2.67	3.29	2.00	16.49
Mean (12 years) .....	4.21	2.86	2.70	1.37	1.75	0.58	0.12	0.12	0.74	1.65	2.81	3.97	22.67

## CLIMATOLOGY OF CALIFORNIA.

## PRECIPITATION OF CALIFORNIA (INCHES AND HUNDREDTHS)—Continued.

## TEHACHAPI, KERN COUNTY

[Elevation, 3,964 feet]

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1877.....	0 56	0 14	0 89	0 60	0 12	0 00	0 02	0 00	0 00	T	0 50	2 91	5 74
1878.....	2 59	6 32	1 76	1 93	0 28	0 09	0 00	T	0 00	0 30	0 04	0 64	13 95
1879.....	2 62	0 45	0 19	1 39	0 09	0 12	0 00	0 00	0 00	0 52	1 03	5 52	11 93
1880.....	2 81	1 94	1 47	2 24	0 00	0 00	0 00	0 00	0 00	0 75	0 10	2 01	11 32
1881.....	1 79	2 05	2 94	0 50	0 06	0 00	0 00	0 00	0 32	0 10	0 60	1 12	8 48
1882.....	0 65	2 91	1 40	0 63	0 20	0 15	0 00	0 00	0 00	0 74	0 18	0 50	7 36
1883.....	0 15	4 47	1 51	2 72	1 73	0 00	0 00	0 00	0 00	0 81	0 14	0 72	12 25
1884.....	1 54	7 26	3 46	1 85	1 26	1 05	0 00	0 64	0 00	0 13	0 29	3 96	21 44
1885.....	0 10	0 00	0 26	1 48	0 30	0 00	0 05	0 31	0 00	0 00	3 70	0 52	6 72
1886.....	1 58	6 06	4 10	4 57	0 00	0 00	0 10	0 00	0 00	T	1 15	0 60	18 16
1887.....	0 50	8 88	0 24	1 95	0 26	0 00	0 00	0 00	0 00	0 86	0 26	1 44	14 39
1888.....	2 57	2 60	1 20	1 25	0 25	0 00	0 00	0 00	0 00	0 00	0 00	3 65	11 52
1889.....	0 40	0 60	3 56	3 96	1 07	0 00	0 00	0 80	0 00	2 70	0 70	5 30	19 05
1890.....	1 75	0 70	0 30	0 00	0 00	0 00	0 00	0 00	0 50	0 00	0 00	3 48	6 73
1891.....	0 03	3 45	0 80	0 90	0 70	0 00	0 00	0 00	1 17	0 00	0 00	3 10	10 15
1892.....	0 92	[2 68]	2 72	0 61	0 55	0 00	0 00	0 00	0 00	0 00	0 00	0 40	7 88
1893.....	0 85	3 61	5 00	0 65	0 00	0 00	0 00	0 00	0 00	0 50	0 50	5 25	16 36
1894.....	2 80	1 68	0 00	[1 24]	0 32	0 27	0 00	0 00	[0 10]	0 00	0 00	3 75	10 16
1895.....	3 21	0 69	1 08	0 50	0 75	0 00	0 00	0 00	0 00	0 44	0 60	0 26	7 53
1896.....	1 57	0 00	2 80	0 63	0 00	0 00	0 00	0 85	0 00	1 45	0 53	1 13	8 96
1897.....	1 78	2 03	0 18	0 25	0 00	0 00	0 00	0 00	0 02	0 38	0 00	1 00	5 64
1898.....	1 20	0 34	1 35	0 10	0 82	0 00	0 00	0 00	0 00	0 00	T	0 20	4 01
1899.....	0 68	0 60	1 62	0 00	0 22	0 38	0 00	0 00	0 00	0 57	1 53	0 61	6 21
1900.....	0 64	0 39	0 29	1 29	0 50	0 23	T.	0 00	0 00	0 46	1 53	0 00	5 33
Mean (24 years) .....	1.39	2.49	1.63	1.30	0.40	0.10	0.01	0.11	0.09	0.45	0.66	1.96	10.47

## TEHAMA, TEHAMA COUNTY

[Elevation, 220 feet.]

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1871.....	3 00	1 60	0 81	1 83	0 80	0 00	0 00	0 00	0 00	T	0 00	0 00	8 04
1872.....	0 00	3 63	1 88	0 99	0 00	0 00	0 00	0 10	1 10	0 07	0 00	2 83	10 10
1873.....	1 46	4 64	0 77	0 08	T	0 00	0 00	0 00	0 00	0 00	0 00	6 63	13 58
1874.....	3 64	2 16	1 84	0 33	0 00	0 00	0 00	0 00	0 00	0 00	1 61	0 00	9 58
1875.....	3 87	0 00	0 47	0 00	0 00	0 00	0 00	T	0 00	0 95	5 15	2 00	12 44
1876.....	4 80	4 44	2 87	0 98	T	T	0 75	T.	0 01	1 59	0 71	0 00	16 15
1877.....	1 87	1 45	1 89	0 04	1 84	0 42	0 10	0 02	0 00	2 05	1 59	1 64	12 91
1878.....	11 35	7 00	4 31	1 34	0 44	0 10	0 00	0 00	0 00	0 55	1 80	0 39	26 78
1879.....	2 07	0 94	1 25	1 55	1 20	0 10	0 01	0 70	0 00	0 92	3 00	4 58	16 32
1880.....	0 78	1 35	0 50	3 62	0 19	0 00	0 00	0 00	0 00	0 05	0 10	5 42	12 01
1881.....	1 65	0 75	0 36	0 82	0 40	0 85	T	0 00	0 35	1 25	0 35	3 09	9 87
1882.....	1 03	2 93	2 17	1 32	0 05	0 28	0 00	0 00	0 08	2 72	3 77	0 62	14 97
1883.....	0 73	0 39	2 14	1 33	2 75	0 00	0 00	0 00	1 03	1 70	0 50	0 44	11 01
1884.....	3 15	2 08	4 94	2 61	0 20	1 55	0 00	0 00	0 00	0 69	0 00	6 16	21 38
1885.....	1 67	0 60	0 05	0 70	0 73	0 72	0 00	0 00	0 48	T.	10 42	3 00	18 37
1886.....	4 08	T	0 98	4 00	0 18	0 00	0 00	T	0 00	0 78	T	2 00	12 02
1887.....	0 33	4 29	1 10	1 56	0 45	0 00	0 00	0 00	0 00	0 00	1 56	2 62	11 91
1888.....	4 70	2 40	4 10	0 25	0 25	0 30	0 00	0 00	0 00	0 00	3 61	8 33	23 94
1889.....	0 20	0 30	10 41	0 62	0 34	0 95	0 00	0 00	0 00	11 58	3 41	11 45	39 26
1890.....	4 68	1 05	3 79	0 75	1 45	0 00	0 00	0 00	0 00	0 00	0 00	2 88	14 60
1891.....	1 08	9 00	1 50	2 28	1 96	0 39	1 00	0 00	0 06	0 50	0 50	4 79	23 04
1892.....	5 35	1 59	1 41	3 00	4 47	0 67	0 00	0 00	0 00	0 23	16 53	12 96	46 26
1893.....	4 68	4 99	3 03	3 76	0 75	0 00	0 00	0 00	1 02	0 03	1 55	1 65	26 46
1894.....	5 92	1 82	1 00	0 50	1 01	0 52	0 00	0 25	0 28	2 37	0 00	7 25	20 92
1895.....	11 23	2 85	2 32	0 48	0 80	0 00	0 60	0 00	2 13	1 17	1 47	2 50	25 55
1896.....	11 15	0 10	2 35	3 90	1 23	0 02	0 00	0 47	0 58	0 65	2 90	4 33	27 68
1897.....	2 53	5 97	1 91	1 11	0 08	0 86	0 00	0 00	0 13	2 43	0 56	1 77	17 40
1898.....	0 55	3 20	0 00	0 25	0 98	0 11	0 00	0 00	0 53	0 53	0 63	1 78	8 54
1899.....	6 11	0 00	4 54	0 37	1 86	0 59	0 00	0 00	0 00	2 06	3 97	3 65	23 15
1900.....	3 59	1 35	1 42	2 85	1 19	0 53	0 00	0 00	0 00	3 61	4 61	2 02	21 17
Mean (30 years) .....	3 53	2 43	2 35	1 44	0 85	0 30	0 03	0 05	0 26	1 28	2 33	3 56	18 51

## PRECIPITATION OF CALIFORNIA (INCHES AND HUNDREDTHS)—Continued.

## TRACY, SAN JOAQUIN COUNTY.

[Elevation, 64 feet.]

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1879.....	2.82	2.07	2.15	0.96	0.66	0.27	0.00	0.00	0.00	0.82	1.55	1.97	12.27
1880.....	0.69	1.08	0.62	2.77	0.25	0.00	0.00	0.00	0.00	0.00	0.43	5.08	10.87
1881.....	1.85	1.61	0.95	0.76	0.00	0.00	0.00	0.00	T.	0.15	0.70	0.85	6.87
1882.....	0.70	0.50	2.43	1.48	0.46	0.00	0.00	0.00	0.20	0.75	0.70	0.20	7.42
1883.....	1.90	0.40	1.88	0.30	1.82	0.00	0.00	0.00	0.20	0.40	0.30	0.55	7.70
1884.....	0.90	3.43	3.27	1.65	0.10	2.05	0.00	0.10	0.00	0.82	0.00	2.49	14.81
1885.....	0.98	0.10	0.10	0.37	0.00	0.00	0.00	0.00	0.00	0.00	5.60	0.85	7.95
1886.....	2.55	0.35	1.40	1.55	0.00	0.00	0.00	0.00	0.00	0.40	0.10	0.50	6.85
1887.....	0.08	2.93	0.29	3.02	0.00	0.00	0.00	0.00	T.	0.00	0.05	2.43	8.75
1888.....	1.99	0.84	0.61	0.00	0.54	0.19	0.00	0.00	0.85	0.00	2.85	1.71	9.08
1889.....	0.60	0.55	3.20	0.30	0.75	0.00	0.00	0.00	0.00	3.02	2.59	6.85	17.86
1890.....	4.76	1.98	1.56	0.97	0.19	0.00	0.00	0.00	1.45	0.00	0.00	1.88	12.74
1891.....	0.85	1.75	1.70	1.54	0.57	0.15	0.00	0.00	0.27	0.00	0.10	3.57	10.00
1892.....	0.43	0.95	1.90	0.71	1.00	0.05	0.00	0.00	0.00	0.00	0.00	7.21	12.25
1893.....	1.22	1.14	1.51	0.55	0.00	0.00	0.00	0.00	0.04	0.00	0.87	0.87	6.20
1894.....	2.13	2.09	0.00	0.03	2.00	1.14	0.00	0.00	1.28	0.43	0.36	4.46	13.92
1895.....	2.82	1.22	0.48	0.50	0.56	0.00	0.00	0.00	0.10	0.40	0.77	0.78	7.61
1896.....	3.89	0.00	0.61	1.98	0.35	0.00	0.12	0.17	[0.20]	0.80	1.45	1.13	10.70
1897.....	1.88	1.77	2.37	0.00	0.00	0.00	0.00	0.00	0.00	1.24	[2.98]	0.72	8.46
1898.....	0.70	0.61	0.85	0.00	0.60	0.00	0.00	0.00	0.00	0.15	0.20	1.26	3.87
1899.....	2.16	0.02	4.89	0.14	0.29	0.00	0.00	0.00	0.00	3.78	2.24	1.47	14.97
1900.....	1.88	0.18	1.45	1.42	2.00	T.	0.00	0.00	0.08	0.52	3.45	0.65	11.58
Mean (22 years).....	1.64	1.16	1.53	0.95	0.55	0.18	0.01	0.01	0.19	0.60	1.15	2.16	10.12

## TULARE (NEAR), TULARE COUNTY.

[Elevation, 274 feet.]

1893.....	0.64	1.20	3.02	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.50	1.07	6.76
1894.....	1.28	0.34	1.16	0.13	0.86	1.15	0.00	0.00	0.50	0.11	0.06	2.99	8.08
1895.....	3.52	1.23	0.86	0.60	0.60	0.00	0.00	0.00	0.20	0.43	0.98	0.36	8.78
1896.....	1.78	0.01	0.72	1.03	0.14	0.00	0.14	0.06	0.08	0.74	1.11	0.46	6.22
1897.....	2.40	1.61	1.29	0.35	0.00	0.00	0.00	0.00	0.58	0.59	0.26	0.79	7.87
1898.....	0.63	0.97	0.72	T.	0.59	0.00	0.00	0.00	3.75	0.01	0.16	0.19	7.02
1899.....	0.92	0.14	2.28	0.17	0.02	0.45	0.00	0.00	T.	1.35	1.32	1.28	7.98
1900.....	1.02	0.10	0.77	1.78	2.08	0.00	T.	T.	0.18	0.04	2.41	0.19	8.52
Mean (8 years).....	1.52	0.70	1.85	0.55	0.47	0.20	0.02	0.01	0.66	0.41	0.85	0.92	7.65

## UKIAH, MENDOCINO COUNTY.

[Elevation, 620 feet.]

1877.....	7.38	4.70	2.14	0.59	0.35	0.00	0.00	0.00	0.00	1.50	4.38	8.59	24.63
1878.....	19.03	17.24	7.60	1.27	0.27	0.00	0.00	0.00	1.05	3.70	0.00	0.68	50.84
1879.....	4.44	6.17	14.47	3.36	2.36	0.00	0.00	0.12	0.60	0.87	5.92	10.08	48.39
1880.....	5.03	2.17	4.45	11.78	1.84	0.00	0.00	0.00	0.00	0.00	0.15	12.27	37.69
1881.....	10.25	4.96	0.70	1.08	0.08	0.00	0.00	0.00	0.22	1.00	1.00	6.72	26.01
1882.....	3.41	7.87	4.06	1.92	0.50	0.00	0.00	0.00	0.73	2.70	3.95	2.88	28.02
1883.....	2.88	1.25	3.62	3.21	2.71	0.00	0.00	0.00	1.15	1.85	0.64	1.81	18.62
1884.....	4.12	3.32	5.42	5.16	0.43	1.01	0.00	0.01	0.40	0.78	0.17	12.94	33.74
1885.....	2.51	1.91	0.25	0.43	0.36	0.14	0.00	0.00	0.15	0.53	19.24	5.43	30.95
1886.....	9.74	0.23	2.96	6.43	0.98	0.00	0.00	0.00	0.00	1.27	0.86	4.43	26.90
1887.....	2.56	7.85	1.74	3.21	0.41	0.00	0.00	0.00	0.30	0.00	1.52	4.89	22.48
1888.....	10.29	2.07	3.84	0.10	0.23	2.18	0.18	0.00	1.51	0.00	4.07	7.48	31.95
1889.....	1.04	0.84	9.94	1.36	4.25	0.15	0.00	0.00	0.00	3.05	4.17	15.63	45.43
1890.....	14.74	5.00	9.47	2.56	0.86	0.00	0.00	0.00	0.49	0.05	0.20	4.80	38.17
1891.....	2.13	10.33	2.44	2.59	1.10	0.32	0.28	0.00	1.00	1.00	0.86	8.60	30.70
1892.....	4.05	3.70	3.56	3.83	2.61	0.00	0.00	0.00	0.00	1.80	7.19	8.93	35.67
1893.....	4.75	6.75	8.36	4.12	1.63	0.00	0.02	0.00	1.85	0.64	8.81	3.65	40.58
1894.....	15.68	9.41	3.03	2.86	1.21	1.27	T.	0.00	0.77	2.45	1.37	15.47	58.02
1895.....	19.20	5.17	4.80	1.36	1.96	0.00	0.11	0.00	1.70	0.21	2.81	4.98	42.30
1896.....	18.68	1.50	3.95	5.97	2.94	T.	0.02	0.04	0.87	1.14	7.00	10.60	50.21
1897.....	4.25	10.35	6.87	0.91	0.09	1.70	T.	0.00	0.10	1.87	3.02	2.77	31.93
1898.....	1.23	7.08	0.68	0.80	1.03	0.65	0.00	T.	0.82	1.24	2.02	2.41	17.96
1899.....	10.54	0.43	7.58	0.56	2.05	0.00	0.00	0.02	0.00	4.06	8.86	6.94	40.99
1900.....	4.55	2.49	3.99	1.91	0.51	0.36	T.	0.00	0.35	5.00	5.42	4.98	29.56
Mean (24 years).....	7.52	5.12	4.83	2.79	1.23	0.33	0.03	0.01	0.57	1.74	3.90	6.77	34.86

## CLIMATOLOGY OF CALIFORNIA.

## PRECIPITATION OF CALIFORNIA (INCHES AND HUNDREDTHS)—Continued

## UPPER LAKE, LAKE COUNTY

[Elevation, 1,350 feet]

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1886.....	6 20	0 00	1 05	4 20	1 30	0 00	0 00	0 00	0 00	0 55	0 25	2 85	16 40
1887.....	1 20	7 10	1 00	1 85	0 00	0 00	0 00	0 00	0 00	0 00	0 00	3 85	15 00
1888.....	7 30	1 40	1 75	0 00	0 80	0 35	T	0 00	0 85	0 00	3 20	3 95	19 60
1889.....	0 05	0 25	6 75	0 55	2 20	0 00	0 25	0 00	0 00	6 35	3 40	10 65	30 45
1890.....	10 60	3 00	6 25	1 40	0 80	0 00	0 00	0 00	0 60	0 00	0 00	6 00	28 65
1891.....	1 50	8 70	1 08	2 93	0 43	0 15	0 13	0 00	0 95	0 62	0 71	7 35	24 55
1892.....	3 93	2 50	2 32	2 84	3 71	0 49	0 00	0 00	T	1 17	5 53	6.93	29 42
1893.....	4 08	3 19	5 47	2 37	1 04	0 00	T	0 00	0 85	0 47	4 83	2.82	25 12
1894.....	10 43	6 21	1 80	1 46	1 02	1 12	0 00	T	0 53	2 05	1 13	11 62	37 37
1895.....	14 89	4 15	3 20	1 41	1 39	0 00	0 05	T	1 23	T	2 09	3 83	32 24
1896.....	11 18	0 80	2 39	6 01	2 07	0 00	T	0 87	0 42	1 04	5 07	6 47	36 32
1897.....	3 45	6 35	4 58	0 42	0 22	0 97	0 05	0 00	0 08	1 67	2 38	2 61	22 78
1898.....	0 93	4 57	0 36	0 43	1 90	0 58	0 00	T	0 60	1 01	1 66	1 34	13 38
1899.....	8 16	0 25	5 59	0 90	1 00	0 05	0 00	0 08	0 00	3 49	6 33	9 79	35 59
1900.....	3 98	1 31	3 53	2 13	0 81	0 35	T	0 00	0 03	3 96	5 08	3 63	24 81
Mean (15 years) .....	5 86	3 32	3 14	1 93	1 25	0 27	0 03	0 06	0 41	1 49	2 78	5 58	26 11

## UPPER MATTOLE, HUMBOLDT COUNTY

[Elevation, 244 feet]

1887.....	9 61	11 91	3 34	9 80	[4 90]	0 59	[0 12]	[0 06]	0 09	0 18	6 44	11 24	58 28
1888.....	41 63	4.13	8 96	1 51	0 43	4 19	0 11	T	0 00	1 06	4 86	13 62	80 55
1889.....	4 99	2 57	20 73	5 25	9 45	0 45	0 00	0 00	0 39	18 92	9 14	29 36	101 25
1890.....	33 40	20 36	17 83	4 38	0 40	0 74	0 07	T	1 52	0 81	0 67	9 88	90 06
1891.....	5 66	17 18	7 85	11 22	6 95	2 00	0 29	T	2 30	4 94	4 55	17 31	80 25
1892.....	10 37	5 58	8 08	9 52	5 80	0 39	0 00	0 00	1 61	4 75	13 69	24 48	84 27
1893.....	6 01	8 25	18 05	10 96	4 13	0 00	0 00	0 00	3 09	3 65	14 93	9 50	78 62
1894.....	27 56	11 97	8 45	3 30	2 05	3 09	0 00	0 00	2 75	6 12	5 52	27 77	99 08
1895.....	23 37	8 88	10 20	6 81	7 20	0 00	0 86	0 00	9 57	0 00	4 73	9 58	81 20
1896.....	26 22	3 59	8 03	17 02	9 91	0 50	0 00	0 65	0 74	3 93	13 44	18 49	102 52
1897.....	6 88	17 86	13 29	1 33	0 53	1 43	0 00	0 00	0 98	4 75	5 93	7 58	61 06
1898.....	3 34	22 25	1 55	2 88	6 93	3 32	0 00	0 00	2 66	1 56	4 86	5 08	54 43
1899.....	14 30	4 24	11 25	1 47	2 84	0 12	0 00	0 22	1 00	9 54	32 85	17 84	95 67
1900.....	12 27	8 20	9 37	6 51	3 61	1 84	0 00	0 00	0 32	15 02	6 56	12 31	76 01
Mean (14 years) .....	16 12	10 50	10 50	6 64	4 66	1 24	0 10	0 07	1 93	5 37	9 16	15 29	81.66

## VACAVILLE, SOLANO COUNTY

[Elevation, 175 feet]

1880.....	3 43	2 23	2 73	8 26	7 55	1 78	0 00	0 00	0 00	0 00	0 07	21 25	47 43
1881.....	15 61	4 58	1 13	2 36	0 00	0 00	0 00	0 00	0 00	0 28	1 93	5 36	31 25
1882.....	2 76	3 33	4 17	2 37	0 19	0 00	0 00	0 00	0 00	1 10	3.77	1 15	22 00
1883.....	2 45	2 11	6 26	2 03	5 63	0 00	0 00	0 00	0 00	2 24	0 49	1 63	22 84
1884.....	6 02	7 19	11 45	7 48	0 24	0 00	0 00	0 00	0 41	1 20	0 00	16 18	50 17
1885.....	1 89	0 23	0 23	1 54	0 00	0 00	0 00	0 00	0 00	0 30	15 98	5 68	25 95
1886.....	8 74	0 17	1 32	4 84	0 05	0 00	0 00	0 00	0 00	0 27	0 14	2 26	17 79
1887.....	1 34	9 40	1 06	2 65	0 00	0 00	0 00	0 00	0 16	0 00	1 01	5 62	21.24
1888.....	6 34	0 45	4 21	0 08	0 04	0 11	0 00	0 00	0 71	0 00	5 77	5 35	23 06
1889.....	0 44	0 98	7 92	0 80	3 04	0 15	0 00	0 00	0 00	7 98	4 26	12 48	38 05
1890.....	11.74	5 49	5 74	0 96	1 40	0 00	0 00	0 00	0 28	0 04	0 00	2 92	28 57
1891.....	0 79	12 93	0 57	2 13	0 67	0 17	0 00	T	0 50	0 18	0 41	6 91	25 26
1892.....	2 36	3 45	2 44	2 31	3 16	0 08	0 00	0 00	0 07	1 45	6 75	7 11	29 13
1893.....	4 50	3 13	4 54	0 80	0 55	0 00	T	0 00	0 18	0 20	3 79	2 55	20 24
1894.....	8 70	4 50	1 13	0 62	1 55	0 84	0 00	0 00	1 13	3 33	0 63	12 80	35 28
1895.....	12 81	3 04	2 07	2 08	1 02	0 00	T	0 00	0.80	0 06	2 15	1.87	25 90
1896.....	14.46	0 15	4 31	7 03	1 25	0 00	T.	0 57	0 40	1 30	6 23	3 54	39 24
1897.....	6 36	4 96	5 23	0 24	0 27	0 09	0 00	0 02	0 07	2 32	1 03	2 08	22 67
1898.....	1 59	3 01	0 19	0 52	1 94	0 00	0 00	0 00	0 49	1 06	0 44	1 30	10.54
1899.....	7 11	0 20	10 26	0 79	1 25	0 32	0 00	0 16	0 00	3 61	3 62	3 67	30 99
1900.....	3 82	0 52	2 46	1 39	0 34	T	0 00	0 00	0 07	1 32	6 26	1 68	17 86
Mean (21 years) .....	5 87	3 44	3 79	2 44	1 44	0.17	T	0 04	0 30	1 44	3 08	5 88	27 88

## GENERAL PRECIPITATION TABLES.

209

## PRECIPITATION OF CALIFORNIA (INCHES AND HUNDREDTHS)—Continued.

## VALLEY SPRINGS, CALAVERAS COUNTY.

[Elevation, 673 feet.]

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1888.....	5.32	0.49	1.74	1.94	0.28	0.00	0.00	0.00	0.47	0.00	2.44	2.29	14.92
1889.....	0.28	0.77	4.22	1.42	2.69	0.00	0.00	0.00	0.00	4.24	4.34	9.54	27.50
1890.....	7.28	3.62	5.03	1.75	2.35	0.00	0.00	0.00	1.20	0.00	0.00	3.07	24.30
1891.....	0.58	3.15	7.45	2.80	0.70	0.74	0.00	0.00	0.23	0.12	0.25	5.75	21.57
1892.....	1.90	1.75	4.15	1.80	2.93	0.15	0.00	0.00	0.12	1.16	3.40	7.66	25.02
1893.....	3.24	3.46	7.32	1.87	0.10	0.00	0.00	0.00	1.13	0.00	3.11	2.08	22.31
1894.....	6.91	5.86	0.91	0.95	4.09	1.28	0.00	0.00	1.00	2.04	1.20	10.51	34.75
1895.....	3.98	2.70	2.65	3.00	1.72	0.00	0.00	0.00	0.50	T.	1.05	2.04	22.64
1896.....	6.43	0.24	3.13	6.59	0.90	0.00	0.33	0.00	0.00	1.77	5.31	3.09	28.29
1897.....	2.97	7.77	6.00	1.53	0.39	0.69	0.00	0.00	0.00	2.35	1.28	1.50	24.48
1898.....	0.98	3.34	0.88	0.46	1.41	0.14	0.00	0.00	0.68	0.34	1.31	2.19	12.21
1899.....	2.78	0.21	7.04	0.55	0.62	0.82	0.00	0.09	0.00	4.53	4.28	4.42	25.34
1900.....	1.46	0.96	2.62	3.19	1.41	0.04	0.00	0.00	0.04	1.58	5.62	1.35	18.27
Mean (18 years) .....	3.78	2.64	4.09	2.13	1.50	0.30	0.03	0.01	0.41	1.43	2.62	4.27	23.20

## VENTURA, VENTURA COUNTY.

[Elevation, 50 feet.]

1892.....	1.01	4.54	2.25	0.57	0.00	0.00	0.00	0.00	0.00	0.70	2.12	5.80	17.02
1893.....	3.17	3.02	3.19	0.42	0.04	0.00	0.00	0.00	0.00	0.85	0.25	3.04	13.98
1894.....	0.81	0.50	0.27	0.17	0.50	0.00	0.13	T.	0.95	0.10	T.	3.13	6.56
1895.....	6.11	1.00	3.17	0.47	0.07	0.00	0.00	T.	T.	0.10	0.74	0.67	12.33
1896.....	5.13	T.	2.16	1.10	T.	T.	0.20	T.	0.00	0.85	1.50	2.58	13.52
1897.....	4.07	4.83	1.77	0.05	0.04	0.00	0.00	0.01	0.50	1.50	0.07	0.00	12.34
1898.....	1.54	0.74	0.68	0.00	1.40	0.00	T.	0.00	1.10	0.12	T.	0.16	5.74
1899.....	4.89	0.00	1.73	0.42	T.	0.71	0.00	0.00	T.	1.56	1.40	1.55	12.26
1900.....	1.90	0.10	1.19	0.38	1.40	T.	T.	0.00	T.	0.25	4.47	0.03	9.72
Mean (9 years) .....	3.13	1.64	2.38	0.40	0.38	0.03	0.04	T.	0.28	0.67	1.13	1.33	12.11

## VINA, TEHAMA COUNTY.

[Elevation, 213 feet.]

1889.....	0.09	0.29	6.95	1.19	1.94	0.50	0.00	0.00	0.00	7.24	2.59	12.16	32.95
1890.....	6.05	3.58	4.28	0.00	2.11	0.00	0.00	0.00	0.51	0.00	0.00	2.21	18.72
1891.....	0.92	9.29	0.50	2.06	0.80	0.50	0.08	0.00	0.00	0.40	0.25	3.53	18.33
1892.....	4.13	1.13	1.50	2.30	1.67	0.19	0.00	0.00	0.00	1.06	3.41	5.88	21.27
1893.....	2.99	3.24	4.02	2.21	0.70	0.00	0.00	0.00	0.63	0.02	1.99	2.15	18.55
1894.....	4.13	2.51	1.41	0.89	0.96	0.51	0.00	0.00	1.05	1.13	0.65	3.28	21.57
1895.....	3.24	2.39	2.60	0.94	1.47	0.00	0.26	0.00	2.13	0.00	1.20	1.71	20.99
1896.....	9.01	0.17	2.16	3.72	1.03	0.00	0.00	0.40	0.96	0.70	3.61	6.00	27.76
1897.....	4.43	4.28	2.05	1.30	0.00	0.25	0.00	0.00	0.20	[1.82]	0.88	1.88	16.59
1898.....	0.85	3.28	[2.89]	[1.02]	[1.19]	0.00	0.00	0.00	[0.61]	[1.32]	0.04	1.05	12.85
1899.....	6.68	0.00	3.78	0.59	0.96	1.13	0.00	0.00	0.00	[1.32]	2.62	2.45	19.53
1900.....	3.07	0.77	1.55	3.30	1.65	0.35	0.00	0.05	T.	1.96	4.45	1.65	18.30
Mean (12 years) .....	4.22	2.58	2.36	1.63	1.21	0.29	0.03	0.04	0.51	1.37	1.31	4.03	20.66

## VOLCANO SPRINGS, SAN DIEGO COUNTY.

[Elevation, —220 feet.]

1889.....	0.82	0.00	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.40	2.74	4.76
1890.....	0.09	0.68	0.00	0.03	0.00	0.00	0.03	0.07	0.00	0.00	0.00	0.47	1.37
1891.....	0.00	2.62	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	2.95
1892.....	0.16	0.59	0.04	0.00	0.01	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.32
1893.....	0.02	0.00	0.00	0.00	T.	0.00	1.20	0.45	0.00	0.00	0.30	0.00	1.97
1894.....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	T.	0.00	1.08	0.00	1.00	2.08
1895.....	1.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.42
1896.....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	T.	0.00	0.00	0.00	[0.52]	0.52
1897.....	0.00	0.00	0.00	0.00	0.00	0.00	T.	0.03	0.00	0.00	0.00	T.	0.03
1898.....	T.	0.00	0.00	0.00	0.00	0.00	0.00	[0.09]	0.00	0.00	0.00	0.47	0.56
1899.....	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.07	0.13	0.19	0.20	T.	0.63
1900.....	0.55	0.00	0.63	T.	0.00	0.00	0.03	0.00	0.03	0.60	0.05	0.00	1.94
Mean (12 years) .....	0.26	0.32	0.11	T.	T.	0.00	0.11	0.09	0.01	0.17	0.03	0.43	1.59

## CLIMATOLOGY OF CALIFORNIA.

## PRECIPITATION OF CALIFORNIA (INCHES AND HUNDREDTHS)—Continued

## WESTLEY, STANISLAUS COUNTY

[Elevation, 90 feet]

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1889.....	0 38	0 33	2 60	0 41	0 88	T	0 00	0 00	0 00	2 65	1 92	4 92	14 09
1890.....	3 48	1 69	0 89	1 13	0 33	0 00	0 00	0 00	0 00	0 00	0 00	1 75	9 27
1891.....	0 12	2 27	1 46	1 21	0 18	0 10	0 00	0 00	0 21	0 11	0 07	3 25	8 98
1892.....	0 44	1 32	1 91	0 82	0 85	0 00	0 00	0 00	0 46	1 74	1 77	4 11	13 42
1893.....	1 38	1 57	2 56	0 74	0 32	0 00	0 00	0 00	0 08	0 00	0 64	1 00	8 29
1894.....	1 98	1 78	0 11	0 04	1 19	0 85	0 00	0 00	0 80	0 65	0 23	4 67	12 25
1895.....	4 16	0 87	1 15	0 91	0 48	0 00	0 00	0 00	0 12	0 04	0 90	0 51	9 14
1896.....	5 62	0 00	1 42	1 45	0 38	0 00	0 35	T	0 31	1 95	4 16	1 01	16 65
1897.....	1 60	2 46	2 03	0 00	0 11	0 08	0 00	0 00	0 00	0 86	0 18	0 75	8 02
1898.....	0 53	0 58	0 68	0 00	0 65	0 00	0 00	0 00	0 12	0 39	0 20	0 89	4 04
1899.....	2 37	0 00	3 17	0 20	0 50	0 00	0 00	0 00	0 00	1 50	2 31	0 88	10 93
1900.....	1 77	0 00	0 55	1 09	2 04	0 00	0 00	0 00	0 65	0 10	4 38	1 38	11 96
Mean (12 years) . . . .	1 98	1 07	1 54	0 67	0 66	0 09	0 03	T	0 23	0 83	1 39	2 09	10 59

## WHEATLAND, YUBA COUNTY

[Elevation, 84 feet]

1888.....	4 13	1 06	2 42	0 16	0 88	0 35	0 02	0 00	0 32	0 00	2 69	5 06	16 59
1889.....	0 12	0 37	5 52	0 80	1 98	0 32	0 00	0 00	0 00	6 41	3 16	7 51	26 19
1890.....	4 75	4 17	4 45	1 40	1 84	0 00	0 00	0 00	1 01	0 00	0 00	2 19	19 81
1891.....	0 52	5 72	1 41	1 72	2 10	0 16	0 08	0 00	0 02	0 14	0 75	3 14	15 76
1892.....	3 12	2 55	4 16	2 29	2 96	0 00	0 00	0 00	0 07	1 04	5 81	4 32	26 32
1893.....	3 16	3 17	3 90	1 14	0 72	0 00	0 00	0 00	0 46	0 28	2 82	1 85	17 50
1894.....	5 71	3 82	1 09	0 66	2 58	0 85	0 00	0 14	0 47	1 62	0 77	10 75	28 46
1895.....	8 95	2 06	1 63	1 34	1 29	0 00	0 05	0 00	2 63	0 10	1 59	1 51	21 15
1896.....	3 54	0 29	2 37	6 21	1 14	0 00	0 00	0 28	1 12	1 18	4 91	2 40	28 44
1897.....	3 13	5 00	1 78	0 92	0 26	0 24	0 00	0 01	0 12	2 23	1 64	1 89	17 22
1898.....	0 85	4 25	0 02	0 24	1 03	0 17	0 00	0 00	0 27	0 84	1 35	1 78	10 80
1899.....	4 38	0 10	5 45	0 29	1 08	0 29	0 00	0 14	0 00	5 73	4 26	3 83	25 55
1900.....	4 67	0 69	1 90	1 58	2 18	T	T	0 00	0 11	2 19	3 98	1 66	18 96
Mean (13 years) . . . .	4 00	2 56	2 78	1 44	1 50	0 18	0 01	0 04	0 51	1 67	2 59	3 68	20 98

## WHITTIER, LOS ANGELES COUNTY

[Elevation, 239 feet]

1889.....	0 15	0 28	3 65	0 15	0 93	0 00	0 00	0 95	0 00	3 21	1 39	[1 78]	12 49
1890.....	5 13	1 58	0 50	0 00	0 00	0 00	0 00	0 00	0 19	0 00	0 15	1 60	9 15
1891.....	0 00	3 37	0 40	0 85	0 30	0 00	0 00	0 00	0 00	0 00	0 00	1 50	11 42
1892.....	0 90	2 15	2 25	0 21	1 69	0 00	0 00	0 00	0 00	0 11	1 40	2 87	11 58
1893.....	3 25	2 43	7 35	0 23	0 20	0 00	0 00	0 00	0 00	1 00	0 20	2 36	17 02
1894.....	0 65	0 55	0 68	0 10	0 00	0 00	0 00	0 00	T	T	0 00	5 08	6 96
1895.....	6 71	0 77	3 30	0 43	0 33	0 00	0 00	0 00	0 00	0 00	0 89	0 39	12 82
1896.....	3 37	0 00	3 60	0 01	0 00	0 00	0 00	0 00	0 00	1 45	2 85	1 52	12 80
1897.....	4 13	4 90	3 57	0 00	0 00	0 00	0 00	0 00	0 00	3 50	0 00	0 00	16 10
1898.....	1 10	0 30	1 41	0 18	2 22	0 00	0 00	0 00	0 00	0 00	0 00	0 75	5 96
1899.....	3 45	0 10	1 84	0 24	0 05	0 70	0 00	0 00	0 00	1 45	1 05	0 96	9 84
1900.....	1 75	0 00	1 20	0 48	2 20	0 00	0 00	0 00	0 00	0 00	8 00	0 00	13 63
Mean (12 years) . . . .	2 55	1 79	2 48	0 24	0 66	0 06	0 00	0 08	0 02	0 89	1 33	1 56	11 65

## GENERAL PRECIPITATION TABLES.

211

## PRECIPITATION OF CALIFORNIA (INCHES AND HUNDRETHS)—Continued.

## WILLIAMS, COLUSA COUNTY.

[Elevation, 89 feet.]

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1877.....	2.16	1.15	0.33	0.05	0.25	T.	T.	0.00	0.00	0.82	0.93	0.82	6.51
1878.....	8.79	6.75	2.29	0.64	0.50	0.00	0.00	T.	0.11	0.37	0.78	0.00	20.18
1879.....	1.80	1.43	2.37	1.48	0.85	0.13	0.00	0.06	0.00	0.13	2.31	2.81	13.37
1880.....	0.78	0.77	0.43	3.67	0.82	0.00	0.00	0.00	0.00	0.00	0.00	7.48	13.95
1881.....	4.02	1.15	0.50	1.65	0.17	0.20	0.03	0.00	0.37	0.58	0.08	1.95	10.70
1882.....	1.32	1.37	1.21	1.15	0.05	0.17	0.00	0.00	0.20	1.13	2.43	0.33	9.36
1883.....	0.73	0.18	1.29	0.88	1.75	0.00	0.00	0.00	0.50	0.20	0.05	0.15	5.23
1884.....	3.01	1.33	3.93	1.96	T.	2.96	0.00	0.00	0.33	0.45	0.00	4.27	18.24
1885.....	1.38	0.53	0.15	1.26	0.00	0.20	0.00	0.00	0.08	0.70	6.51	3.10	13.91
1886.....	3.83	0.00	0.89	3.01	0.00	0.00	0.00	0.00	0.00	0.60	0.00	0.95	9.28
1887.....	0.35	4.35	1.30	1.36	0.00	1.18	0.00	0.00	0.00	0.00	0.68	1.31	10.53
1888.....	2.22	0.70	1.72	0.00	0.67	0.08	0.04	0.00	0.50	0.00	4.10	2.67	12.70
1889.....	0.32	0.50	3.42	0.15	0.95	0.05	0.00	0.00	[0.30]	4.00	1.80	7.50	18.99
1890.....	3.20	2.90	3.30	0.65	1.77	0.00	0.00	0.00	0.75	0.00	0.00	1.79	14.36
1891.....	0.24	9.62	0.35	1.44	0.30	0.12	0.00	0.00	0.00	0.00	0.15	2.05	14.27
1892.....	2.33	1.34	1.54	1.10	1.74	0.00	0.00	0.00	0.00	0.00	0.00	2.44	10.49
1893.....	3.07	2.80	3.66	0.60	1.14	0.00	0.00	0.00	0.19	0.08	1.02	0.63	13.19
1894.....	3.27	1.07	0.86	0.15	1.59	0.60	0.00	0.00	1.18	0.91	0.18	7.27	17.08
1895.....	6.32	1.23	1.34	0.75	0.13	0.00	T.	0.00	0.88	0.13	1.25	1.01	13.09
1896.....	7.47	0.18	1.65	2.90	0.36	0.00	T.	1.10	0.70	0.55	2.14	4.10	21.15
1897.....	2.90	2.74	1.48	0.25	0.20	0.31	0.00	0.00	T.	1.27	0.52	0.85	10.52
1898.....	0.35	2.32	0.00	0.20	0.90	0.00	0.00	0.00	0.48	0.43	0.20	0.94	5.87
1899.....	4.77	0.00	3.33	0.22	0.15	T.	0.00	0.00	0.00	3.28	2.87	3.01	17.48
1900.....	2.24	0.20	0.80	1.13	0.58	0.05	0.00	0.00	T.	0.61	2.58	0.77	8.96
Mean (24 years).....	2.79	1.86	1.59	1.09	0.62	0.25	T.	0.05	0.28	0.68	1.26	2.43	12.89

## WILLOWS, GLENN COUNTY.

[Elevation, 138 feet.]

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1879.....	1.68	0.83	1.16	1.35	0.56	0.08	0.02	0.05	0.00	0.05	3.07	4.55	13.40
1880.....	0.68	0.60	0.74	3.83	0.42	0.00	0.00	0.00	0.00	0.00	0.10	6.33	12.65
1881.....	3.75	1.12	0.56	1.64	0.17	0.18	0.00	0.00	0.44	0.47	0.10	2.23	10.66
1882.....	0.67	2.00	1.47	0.63	0.00	0.27	0.00	0.00	0.00	1.10	2.30	0.49	8.93
1883.....	0.43	0.23	1.40	0.86	1.64	0.00	0.00	0.00	0.41	1.30	0.15	0.05	6.47
1884.....	5.42	3.11	4.80	2.58	0.12	0.90	0.00	0.00	0.13	0.69	0.00	4.18	21.93
1885.....	1.19	0.24	0.05	0.94	0.20	0.18	0.00	0.00	0.30	0.30	7.28	3.37	14.05
1886.....	4.04	1.36	0.35	2.45	0.00	0.00	0.00	0.00	0.00	0.00	T.	1.19	9.39
1887.....	0.17	2.77	1.16	2.78	0.00	0.00	0.00	0.00	0.00	0.00	0.95	2.17	10.00
1888.....	2.99	1.38	1.82	0.08	0.24	0.29	0.00	0.10	0.10	0.00	2.43	3.61	13.04
1889.....	0.54	0.66	1.53	0.27	0.71	0.30	0.00	0.00	0.00	6.33	2.30	8.52	21.71
1890.....	5.36	1.98	3.85	0.55	0.55	0.00	0.00	0.00	0.00	0.88	0.00	3.45	18.62
1891.....	0.67	9.03	0.96	1.88	1.99	0.05	0.00	0.00	0.04	0.24	0.51	3.59	13.96
1892.....	3.45	3.20	2.93	1.71	2.95	0.20	0.00	0.00	0.00	0.55	5.75	6.45	27.19
1893.....	4.80	4.30	4.05	0.95	0.45	0.00	0.00	0.00	0.14	0.00	2.40	0.98	18.07
1894.....	3.65	0.95	1.03	0.40	1.10	0.30	0.00	0.00	0.75	0.93	0.07	9.39	19.12
1895.....	9.97	1.65	1.55	0.90	0.78	0.00	0.08	0.08	1.21	1.29	2.48	0.82	20.81
1896.....	9.96	0.10	2.06	3.22	0.33	0.00	0.00	0.62	0.75	0.85	2.55	5.19	26.13
1897.....	2.81	4.26	0.62	0.47	0.40	0.30	0.00	0.00	0.00	0.93	0.54	0.47	10.85
1898.....	0.70	2.46	T.	0.26	1.17	T.	0.00	0.00	0.36	0.70	0.30	0.99	6.94
1899.....	6.56	0.00	3.20	0.50	0.20	0.24	0.00	T.	0.00	2.40	3.31	2.74	19.15
1900.....	2.95	0.15	1.10	1.33	1.15	0.10	0.00	0.00	T.	2.13	4.37	1.00	14.23
Mean (22 years).....	3.29	1.93	1.66	1.34	0.72	0.18	T.	0.04	0.21	0.99	1.86	3.26	15.47

CLIMATOLOGY OF CALIFORNIA.

PRECIPITATION OF CALIFORNIA (INCHES AND HUNDREDTHS)—Continued.

WINTERS, YOLO COUNTY.

[Elevation, 136 feet ]

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1889 .....	0 36	0 50	8 40	0 58	1 92	0 15	0 00	0 00	0 00	5 95	4 58	12 74	35 18
1890 .....	12 17	5 03	4 63	0 97	1 48	0 00	0 00	0 00	0 23	0 00	0 00	3 71	28 22
1891 .....	0 00	13 52	1 10	2 05	0 75	0 30	0 00	0 00	0 50	0 00	0 34	3 57	22 13
1892 .....	2 77	3 13	1 89	0 82	2 08	0 00	0 00	0 00	0 00	0 61	0 00	12 68	24 98
1893 .....	4 47	3 87	4 93	0 93	0 37	0 00	0 00	0 00	0 00	0 03	2 07	2 02	18 69
1894 .....	8 07	3 53	0 73	0 60	1 20	0 00	0 00	0 00	0 85	1 39	0 44	14.70	31.51
1895 .....	13 37	1 95	1 26	1 38	0 92	0 00	0 00	0 00	1 04	0 00	1 85	0 86	22 63
1896 .....	14 81	0 25	3 26	5 69	0 50	0 00	0 00	0 58	0 07	0 41	3 50	2 60	31 67
1897 .....	6 59	5 54	3 96	0 02	0 00	0 00	0 00	0 00	0 00	1 55	0 02	1 76	19 44
1898 .....	0 40	2 59	0 00	0 26	1 45	0 00	0 00	0 00	0 42	1 20	0 29	1 35	7 96
1899 .....	6 81	2 59	4 98	0 69	0 76	0 28	0 00	0 04	0 00	2 32	2 43	3 02	23 92
1900 .....	4 87	0 38	1 23	0 97	0 75	0 00	0 00	0 00	0 00	0 41	6 18	1 46	16 25
Mean (12 years) .....	6 22	3 57	3.03	1 25	1 02	0 06	0 00	0 05	0 26	1 16	1 81	5 12	23 55

WIRE BRIDGE, PLACER COUNTY

[Elevation, 565 feet ]

1894 .....	9.18	9 07	2 19	1 27	2 65	1 02	0 00	T	0.74	2.60	1 17	13 31	43 20
1895 .....	14 44	3 15	3 34	3 46	2 21	0 00	T	0 25	1 81	0 14	1 27	2.74	32 31
1896 .....	11 40	0 58	6 33	8 00	2 46	0 00	0 30	0 13	0 91	1 04	8.75	3 04	43 04
1897 .....	2 20	9 96	7 13	1 60	0 17	0 28	0 00	0 10	0 29	2 43	2 47	3 26	29.89
1898 .....	1 17	6 58	0.40	0 43	2 09	0 88	0 00	0 00	0 60	1.90	3 47	2 63	20 20
1899 .....	6 22	0 20	13 18	0 55	1 34	1 30	0 00	0 12	0 00	6 53	8 32	6 06	43 32
1900 .....	5 22	1 68	4 32	3 44	2 34	T	0 00	0 00	0.43	4 00	5 37	1 95	29 75
Mean (7 years) .....	7 12	4 46	5 35	2 69	1 89	0 50	0 04	0 09	0 68	2.66	4 47	4 71	34 67

WOODLAND, YOLO COUNTY

[Elevation, 63 feet ]

1873.....	1 25	2 34	0 56	0 13	0 00	0 00	0 00	0 00	0 00	0 20	1 15	10 44	16 62
1874 .....	5 99	1 33	2 35	0 64	0 40	0 00	0 00	0 00	0 00	3 26	2 79	0 16	17 42
1875 .....	5.22	0 35	0 66	0 00	0 15	1 59	0 00	0 00	0 00	0 44	3 37	2 49	14 77
1876.....	4 40	4 35	4 24	1 40	0 45	0 00	0 16	0 00	0 17	3 37	0 27	0 00	19 31
1877 .....	3 95	1 42	0 77	0 03	0 53	0.00	0.00	0 00	0 00	0 94	1 10	1 29	10 03
1878 .....	11 52	7 61	2 30	1 25	0 68	0 00	0 00	0 00	0 25	0 34	0.88	0 01	24 34
1879 .....	2 62	3 25	4 43	2 40	1 70	0 00	0 00	0 00	0.00	0 22	7 15	3 66	25 48
1880 .....	1 33	1.22	0 97	6 34	0 28	0 00	0 00	0 00	0 00	0 00	0 00	8 73	19 37
1881 .....	4 50	1 93	0 97	1 39	0 00	0 35	0 00	0 00	0 50	0.25	1 37	2 37	14 13
1882 .....	1 24	1 37	2 34	1 51	0 03	0 07	0 00	0 00	0.82	2 04	2 42	1 05	13 39
1883 .....	0 91	0 60	3 24	1 22	4 65	0 00	0 00	0 00	0 54	1 04	0 30	0 54	13 04
1884 .....	3 67	4 07	6 53	4 03	0 00	3 02	0 00	0 00	0 22	1 61	0 00	5 57	28 72
1885.....	1 62	0 15	0 15	1 50	0 00	0 00	0 00	0 00	0 06	0 05	8.70	2 73	14 96
1886.....	5 31	0 00	1 71	4 14	0 00	0 00	0 00	0 00	0 00	0 59	0 00	1 39	13 64
1887 .....	0 88	7 56	0.75	1 90	0 00	0 00	0 00	0 00	0 00	0 00	0 60	3 67	15 36
1888 .....	3 38	0 97	2 30	0 10	0 77	0 00	0 00	0 00	0 56	0 00	6 25	4 51	19 34
1889 .....	0 19	0 49	6 14	0 34	2 01	0 43	0 00	0 00	0 00	5 54	3 54	8 16	27 34
1890.....	5 10	2 40	3 35	1 00	1 60	0 00	0 00	0 00	0 60	0 00	0 00	2 35	16 40
1891.....	0 82	3 03	0 35	1 17	0 43	0 00	0 00	0 00	0 00	0.00	0 40	3 10	14 35
1892 .....	2 05	2 73	2 14	1 28	2 22	0 00	0 00	0 00	0 00	0 57	5 47	6 10	22 56
1893 .....	2 38	2 78	2 00	0 62	0 61	0 00	0 00	0 00	0 00	0 08	1 71	1 30	12 48
1894 .....	3 99	2 00	0 30	0 33	1 45	0 64	0 00	0 00	0 82	1 01	0 35	10 69	22 58
1895.....	9 63	1 13	0 33	0 47	0 40	0 00	0.00	0 00	1 33	0 00	1 56	0 37	16 27
1896 .....	11 40	T	2 37	6 43	0 64	0 00	0 00	0.36	0 44	1 27	3 74	1 78	28 43
1897 .....	3 10	4 35	2 13	0 19	0 00	0 00	0 00	0 00	T	1 69	0 58	0 00	12 59
1898.....	0 41	2 03	0 00	0 23	1 23	0 21	0 00	0 00	0 35	1 03	0 52	1 37	7 63
1899 .....	5 02	0 00	4 37	0 26	0 50	0 38	0 00	0 00	0 00	3 55	3 29	3 45	21 92
1900 .....	2 14	0 40	1 20	0 96	0 54	0 00	0 00	0 00	0 00	1 46	5 17	1 22	13 09
Mean (28 years) .....	3 77	2 39	2 20	1 51	0 76	0 26	0 01	0 01	0.24	1 09	2 29	3 20	17 74



## PRECIPITATION OF CALIFORNIA (INCHES AND HUNDREDTHS)—Continued.

## YREKA, SISKIYOU COUNTY.

[Elevation, 2,635 feet.]

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1872.....	3.83	1.91	1.67	0.24	0.44	0.00	0.14	0.00	0.25	1.55	1.43	3.72	15.18
1873.....	1.28	1.77	0.40	0.90	0.60	0.00	0.00	0.00	0.44	0.55	1.17	2.20	9.31
1874.....	3.78	1.62	1.49	0.74	0.34	0.44	0.00	0.00	0.00	1.29	2.16	0.00	11.86
1875.....	4.35	0.19	1.23	0.17	0.51	0.30	0.07	0.00	0.00	3.34	5.29	6.07	21.52
1876.....	2.00	1.93	2.07	0.42	0.65	0.20	0.32	0.19	0.90	3.05	0.43	0.26	12.42
1877.....	1.20	3.24	1.48	0.74	1.56	0.65	0.18	0.00	0.00	0.20	3.64	0.95	13.84
1878.....	6.12	3.91	2.80	0.37	0.56	0.00	0.35	0.40	0.45	0.25	1.15	0.45	16.81
1879.....	1.53	1.41	3.96	1.56	1.42	0.39	0.22	0.15	0.00	0.77	2.32	7.23	20.96
1880.....	2.43	0.61	1.20	2.23	0.41	0.00	0.15	0.00	0.00	0.13	0.10	2.42	9.68
1881.....	11.78	2.58	0.19	1.48	0.00	1.65	0.59	0.26	0.30	3.24	0.68	1.60	24.35
1882.....	1.81	1.96	0.42	1.20	1.02	0.00	0.00	0.00	0.90	1.88	1.89	2.09	13.17
1883.....	1.38	0.47	0.53	1.26	1.76	0.00	0.33	0.25	0.33	1.35	0.66	2.95	11.27
1884.....	2.10	1.20	2.44	1.41	1.40	1.78	1.33	0.51	0.33	0.00	0.79	6.19	19.48
1885.....	1.16	2.94	0.00	1.12	3.65	1.66	0.58	0.00	0.49	0.29	6.98	2.10	20.97
1886.....	4.03	0.91	0.74	1.78	1.05	0.00	1.51	0.15	0.00	1.69	0.30	4.14	16.30
1887.....	3.21	3.01	0.41	2.35	1.42	0.34	1.28	0.31	0.21	0.00	1.04	1.99	16.07
1888.....	4.90	1.19	1.16	0.11	1.12	2.39	0.24	0.00	0.87	0.34	1.13	0.00	13.45
1889.....	1.30	1.30	2.12	1.32	1.70	0.10	0.94	0.00	0.00	3.53	2.23	4.08	13.62
1890 <sup>a</sup> .....													
1891.....	0.45	3.59	1.15	0.93	1.48	1.36	0.41	0.00	0.32	0.43	2.50	3.92	17.04
1892.....	1.65	0.15	1.02	[1.06]	[1.29]	0.87	0.31	0.00	0.61	0.05	3.37	3.64	14.02
1893.....	1.20	2.53	1.53	2.10	0.87	0.32	0.58	0.08	1.12	0.54	7.83	2.11	20.81
1894.....	7.53	3.22	3.32	0.10	3.31	0.70	0.77	0.41	0.01	1.60	0.57	5.40	27.00
1895.....	5.30	1.03	2.26	0.31	1.59	0.00	0.43	0.68	0.32	T.	0.86	4.31	13.09
1896.....	7.37	1.08	1.89	2.28	2.75	0.31	0.73	1.01	0.52	0.39	5.02	3.70	23.05
1897.....	0.42	3.89	2.13	0.39	0.58	1.51	0.00	0.20	0.12	0.68	2.94	3.76	13.67
1898.....	0.33	1.44	0.42	0.48	2.08	0.10	0.02	0.05	0.14	0.51	2.74	1.04	9.85
1899.....	2.75	1.95	1.77	0.21	0.62	0.61	0.03	0.12	0.07	2.34	5.00	3.30	19.27
1900.....	1.35	2.13	1.12	0.42	0.37	1.36	0.00	1.35	0.43	3.66	2.00	3.23	17.42
Mean (23 years).....	3.11	1.90	1.46	1.01	1.24	0.64	0.41	0.22	0.36	1.22	2.36	2.98	16.91

## YUBA CITY, SUTTER COUNTY.

[Elevation 70 feet.]

1892.....	3.28	3.43	3.54	1.91	3.03	T.	0.00	T.	0.20	1.17	6.75	5.52	23.33
1893.....	2.99	3.22	3.75	1.01	1.07	0.00	0.00	0.00	0.31	0.25	2.49	2.19	17.23
1894.....	4.95	2.32	0.89	0.46	2.26	0.70	T.	0.00	0.30	1.99	0.36	11.15	23.33
1895.....	9.58	1.75	1.12	1.00	0.58	0.00	T.	T.	2.79	0.06	1.35	1.25	19.93
1896.....	10.07	0.32	2.21	5.69	0.90	T.	T.	0.30	0.97	0.76	5.43	2.71	29.36
1897.....	4.94	4.13	2.10	1.00	0.42	0.07	0.00	0.03	0.23	2.23	1.30	1.73	13.23
1898.....	0.66	4.36	T.	0.35	1.47	0.00	0.00	0.00	0.41	0.50	0.92	1.42	10.09
1899.....	5.07	0.11	6.67	0.63	1.54	0.43	0.00	0.13	0.00	4.42	4.32	3.62	27.49
1900.....	5.20	0.45	1.91	2.67	1.06	0.16	0.00	0.10	0.10	2.17	4.27	1.71	19.30
Mean (9 years).....	5.19	2.24	2.47	1.64	1.37	0.15	T.	0.07	0.65	1.51	3.19	3.43	21.94

<sup>a</sup> No data.



# SNOWFALL.

At the beginning of the year 1901 the weather bureau office at San Francisco made an effort to collect reports concerning the amount of snowfall in the mountains chiefly for the purpose of affording some data upon which forecasts of the probable supply of water available for irrigating, mining, and other purposes might be based. Not for many years had the snowfall been so heavy in central and southern California as during the winter of 1900-1901 and the outlook for an abundant supply of water so promising. It does not necessarily follow that a winter of heavy snowfall is succeeded by a season of bountiful water supply. In some States it has been found that dry ground absorbs so large a proportion of snowfall under certain favorable conditions that the anticipated run-off is not reached. Again, the melting of the snow may not occur rapidly enough and the evaporation prove excessive, especially if high north winds or mountain winds of the "Chinook" type prevail. Finally the manner in which the snow packs as it falls will determine largely the rate of flow during the ensuing warm months. During the month of February, 1901, the snowfall generally in the mountains of California was heavy. Particularly in the southern half of the Sierra Nevada and Sierra Madre was this the case. The following forecast was made at the close of February and was amply verified:

There is every prospect of an abundant supply of water during the coming spring and summer months. In the mountains of the central and southern portions of the State there is stored a sufficient quantity of well-packed snow, probably in excess of the amounts for any season for four or five years past. In northern California, while there will be an ample supply of water, the snowfall has not been as heavy as might have been expected during the wet winter.

Following are the notes made by different observers who were kind enough to make snowfall reports:

## JANUARY, 1901.

### NORTHERN CALIFORNIA.

*Bear Valley (near Emigrant Gap).*—Snowfall heavier than last year, but considerably less than average. The weather has been too warm for snow, but have had plenty of rain. Until four years ago the snowfall was from 8 to 14 feet on a level, but since then it has not been more than 4 feet. (James Rose.)

*Bodie.*—Snowfall last season, to January 26, 42 inches; this season, to same date, 139 inches. (Benjamin Robinson.)

*Edmonton (Meadow Valley).*—Average snowfall, 70 inches; this season, to January 26, 136 inches; last season, to same date, 47 inches; total precipitation this season, same date, 50.34 inches; last season, 51.35 inches. (J. A. Edman.)

*Greenville.*—Average snowfall, about 36 inches; this season, to January 3, 43 inches. The snow is melting slowly and will be of much benefit to crops. (C. H. Higbie.)

*Iowa Hill.*—The snowfall in 1890 was about 100 inches. It has been decreasing every season; last season, 8 inches. (C. F. Macy.)

*Laporte.*—Snowfall last January, 98 inches; this year, to January 26, 94.5 inches. The average snowfall from July 1 to June 31, for five seasons, is 288 inches. The average January snowfall is 76 inches. (C. W. Hendel.)

*North Bloomfield.*—The supply of water is probably not greater than last season, but depends upon February and March storms. Average snowfall, about 24 inches; above timber line, 84 inches. (L. L. Myers.)

*North San Juan.*—Average snowfall, 2 to 3 inches; at timber line, 6 to 8 feet; above timber line, 10 to 14 feet. (Dr. A. Fouch.)

*Quincy.*—Average snowfall, about 42 inches; will have best water season since 1897. (W. J. Edwards.)

*Red Bluff.*—More snow than usual; greater supply of water. (Maurice Connell.)

*Redding.*—Average snowfall, about 7 inches. In mountains to the west, snow very heavy and much above average; to the east (Sierras), much lighter. (L. F. Bassett.)

*Rosewood*—Average snowfall, about 8 inches; for 1899, 22 inches, 1900, none (C F. Stivers)

*Shasta*—Average snowfall, 8 inches, this year above average (Dr T J. Edgecomb.)

*Sisson*—From appearance of surrounding mountains there is double the amount of snow to same date last year. Mount Eddy and Mount Shasta are covered and canyons are full (C F Galbreath)

*Susanville*—Snowfall to January 31, 1894, 23 inches, 1895, 117 inches, 1896, 16 inches, 1897, 36 inches; 1898, 9 inches, 1899, 50 inches, 1900, 45 inches (James Branham)

*Truckee*—Average snowfall, 95 inches, at timber line, 13 feet, above timber line, 16 feet Snowfall for this season above average (C B. White)

*Yreka*—The snowfall this season, 63 inches, is greater than in any year since 1890 and the heaviest for one storm ever known (Robert Rankin)

#### COAST AND BAY SECTIONS

*Eureka*.—In the mountains, at an altitude of 4,000 feet, the snow is deep It is reported that the snowfall is unusually heavy in Trinity and Siskiyou counties (A. H. Bell)

*Iaqua, Humboldt County*—Average snowfall; about 18 inches, this season above average. More precipitation this year than in any year since 1862 (W E Williams)

*Simmler, San Luis Obispo County*—No snow to date, average fall about 4 inches. Rainfall to January 26, 10 inches; total last season, 57.0 inches (A F Hubbard.)

#### SAN JOAQUIN VALLEY

*Bigtrees, Calaveras County (elevation 4,700 feet)*—Snowfall, November 19 to January 10, 50 inches, rainfall to January 11, 29 inches. (J M Hutchings.)

*Bishop*.—Snowfall more than for several years, rainfall in Owens Valley greater than usual. (W A Chalfant.)

*Fort Tejon, Kern County*—Snowfall not above average, which is about 3 feet, and from 4 to 5 feet above timber line. (J G. Stitt.)

*Independence*.—Snowfall at station, 7 inches—about double that of last year and more than average for past four years The water supply will be very much greater than last season (John J McLean)

*Summerdale*—This season's snowfall (to January 31) is about 12 inches more than last season's, but less than average The average at timber line is 3 to 4 feet and above timber line 10 to 15 feet The rainfall has been the heaviest on record (J. H. Lowry)

*Tehachapi*.—Snowfall exceeds that of last season Average, about 3 feet, in the higher mountains, 12 feet. (W. H. Knapp.)

*Tejon Rancho, Kern County*—Creeks and springs are lower than I have known them for twenty years past (R M Pogson)

*Thebe, Inyo County*—Snowfall greater than last season's Average, about 12 inches, at timber line, probably 8 to 10 feet. (C Kispert)

*West Point*.—Snowfall about the same as last season's and considerably less than average. (T. A Wilson.)

#### SOUTHERN CALIFORNIA.

*Beaumont*—Snowfall greater than last season's, but less than average, at timber line the average is 15 feet. (J. W. Elder.)

*Campo, San Diego County*—Snowfall exceeds last season's, but is less than average; the same is true of rainfall. (A. Campbell.)

*Cuyamaca*—Average snowfall for thirteen years, 33 inches, this season (to January 26), 1 inch. Owing to heavy rains, the water supply will probably be greater than last season (G H Nelson)

*North Ontario*.—Average snowfall in the mountains, 8 to 12 feet, the fall exceeds last season's, and the water supply will be greater (A. P Harwood)

*San Jacinto*.—Snowfall in the upper valley on the 27th and 28th of January, from 6 to 10 inches (C A. Harper)

#### FEBRUARY, 1901

#### NORTHERN CALIFORNIA

*Bear Valley (near Emigrant Gap)*.—This season's snowfall is about 75 inches greater than last season's. Snow on ground February 9, over 5 feet, February 25, 30 inches, at the summit February 10, 14 feet Heavy warm rain reduced snow. (James Rose)

*Blue Canyon*—Very little snow left here now (February 23) The snowfall has been 4 feet greater than last season's. (J. Knapp)

*Bodie*—Snowfall greatly exceeds last season's, 48 inches on ground February 20. (Benjamin Robinson.)

*Bowman's dam*.—Snowfall much greater than last season's, 54 inches on ground February 28, 8 feet February 10, which was reduced by warm rains (A F. Hippert)

*Castle Crag*.—Snow on ground February 28, 10 inches, snowfall greatly exceeds last season's The water supply will be much greater than last season (H O Wickes.)

- Cedarville*.—Snowfall to February 25 has been 29 inches in excess of last season's; now on ground, about 12 inches. (T. H. Johnstone.)
- Dunsmuir*.—Snowfall greatly exceeds that of last season; on ground February 6, 60 inches. (R. K. Montgomery.)
- El Dorado*.—Snow on ground February 23, 4 inches; average fall at timber line, 12 feet; above timber line, 16 feet; snowfall greatly exceeds last season's. (C. E. Deuden.)
- Elder (Humboldt County)*.—Snowfall greater than last season's; on ground February 25, 6 inches. (William Lyons.)
- Eureka*.—On South Fork Mountains, 100 miles east, snow is reported 20 feet deep. Warm rains are melting snow rapidly. (A. H. Bell.)
- Georgetown*.—Snowfall exceeds last season's; 27 inches fell during February, but there is none on the ground now. (C. M. Fitzgerald.)
- Grass Valley*.—Snowfall exceeds last season's; none on ground at present. (B. F. Berriman.)
- Greenville*.—Eight inches of snow on ground March 1, and much heavier in timber; snowfall exceeds last season's. (C. H. Higbie.)
- Lyonsville (Tehama County)*.—This season's snowfall, 4 feet, has been the heaviest in three years, but there is none on ground at present. (J. C. Hillhouse, P. M.)
- Manton (Tehama County)*.—The snowfall is above average; on ground February 25, 12 inches. (W. E. Hazen.)
- Markleeville*.—The seasonal snowfall is more than double that of last season and the water supply will be much greater. (H. F. Musser, P. M.)
- Montague*.—The snowfall exceeds that of last season; on ground February 23, 42 inches. (H. A. Roterman.)
- Oleta*.—Snowfall this season, 4 inches, which melted the following day; last season, none. At elevations of 5,000 feet the snow has nearly all disappeared. (Isaac Cooper.)
- Placerville*.—More snow has fallen this winter than for many years, but there is none on ground at present. The average seasonal snowfall at timber line is 10 inches; this season, 4 feet. (J. Leigh Rowley.)
- Quincy*.—This season's snowfall, over 90 inches, is greater than last. On ground February 27, 12 inches. Average at timber line, 12 feet; above, 20 feet. (W. J. Edwards.)
- Rosewood*.—Snowfall last season, 1 inch; this season, 12½ inches; none on ground at present. At 4,000 feet elevation the average seasonal is about 3 feet; in January, this year, 6 feet. (H. F. Stivers.)
- Susanville*.—This is the best season since 1895; snowfall double that of last season. None on ground at present. (James Branham.)
- Truckee*.—Snowfall greater than last season's; on ground February 23, 9 inches; average seasonal at timber line 13 feet; above, 16 feet. (C. B. White.)
- Weaverville*.—Snowfall greater than last season's; none on ground here February 27; at timber line, about 3 feet; average at timber line, 8 feet; above, 10 feet. (A. S. Paulson.)

CENTRAL AND SOUTHERN CALIFORNIA.

- Bishop*.—The season's snowfall exceeds that of last season and the water supply will be much greater. (W. A. Chalfant.)
- Independence*.—Greatest seasonal snowfall to date for nine years. At 11,000 feet elevation the approximate depth February 26, is 7 feet; average seasonal at timber line, 10 feet. (John J. McLean.)
- Mokelumne Hill*.—Season's snowfall greater than last; 6 inches fell during February. In the mountains the fall during February was greater than for several years. Creeks and springs are full. The water supply will be much greater than last season. (C. E. Prindle.)
- Summerville*.—The season's snowfall to March 1 is 18 inches more than last season's; 28 inches now on ground. The snow is packed like ice and the ground is very wet. (J. H. Lowry.)
- Tehachapi*.—Seasonal snowfall greater than last; on ground February 24, 12 inches. Water supply will be greater than last season. (W. H. Knapp.)
- Campo*.—The snowfall exceeds last season's—in the valleys February 10, 6 feet; on the 26th, over a foot on the levels, with drifts 8 to 9 feet deep. Rainfall for season, 22 inches. (A. Campbell.)
- Cuyamaca*.—Snowfall to February 28, 49 inches, nearly all melted. Cuyamaca Lake is now at 24-foot level; last season it reached only the 13-foot level. (G. H. Nelson.)
- San Jacinto*.—More snow this season than for past four years; on ground near Strawberry Valley February 25, 42 inches. (C. A. Harper.)

Snow rarely falls along the coast of California; thus at San Francisco snow has fallen only on the dates following since March 1, 1871.

## DATES OF SNOWFALL IN SAN FRANCISCO SINCE MARCH 1, 1871

- January 21, 1876.*—Light snow fell for 10 minutes  
*December 31, 1882* —Heavy snow fell from 11 30 a m to 4 20 p. m ; amount, 3 5 inches  
*February 6, 1883* —A few flakes of snow fell during the day  
*February 7, 1884* —Snow fell at intervals during the day, depth varying from 1 to 2 inches  
*February 5, 1887* —Snow fell during the day; depth at office 3 7 inches, while in the western portion of the city it was fully 7 inches deep  
*January 4, 1888* —A few flakes of snow fell during the day.  
*January 16, 1888.*—Light snow fell to the depth of 0 1 inch  
*March 2, 1894* —A few flakes of snow fell during the day  
*March 2, 1896* —Snow mixed with rain fell at intervals during the day  
*March 3, 1896* —Heavy snow fell during the night, depth at office at 8 a m , 1 inch

Yet during nearly every winter snow may be seen upon the summit of Diablo, Mount Tamalpais, the Berkeley Hills, and ranges of Contra Costa County. Similarly in the southern part of the State during the months of January and February one may walk from the orange groves a comparatively short distance up the mountain sides and find snow. At Los Angeles, for example, in two or three hours one may pass from almost semitropical conditions into alpine conditions. Nearly every pronounced southeast storm during the winter months leaves a generous snowfall in the mountains of the entire State. The amount of snow varies naturally with the elevation, and also varies greatly with different storms. Heavy snow often falls on the ranges in the extreme southern portion of the State. In general the heaviest snowfall is found in the Sierra Nevada and the northern portion of the Coast Range. Elevations of from 3,500 to 5,500 feet apparently have a heavier snowfall than greater elevations.

Tables of snowfall in the Sierra for the last twenty-three years show that from 20 to 40 feet are not unusual annual snowfalls. At Summit there is a record of nearly 60 feet of snow during the year 1894. It is a matter of some difficulty to obtain reliable snowfall measurements. The ratio of 10 to 1, which is used by the Weather Bureau in reducing snow to rain, is but an approximation, and the ratio may be as large as 20 to 1 in the case of dry, fine snow at great elevation, and as small as 3 to 1 in the case of damp snow mixed with rain. A careful measurement at Fordyce, Cal., by Mr. E. E. Roeming, on February 8, 1901, showed a depth of snow as being 36 inches, but when melted it amounted to only 1 70 inches. It is plain that when the temperature is low it takes a large amount of snowfall to make an inch of water. In the case mentioned the ratio of snow to water was 21 to 1, and the writer has been told by reliable observers that in the mountains of California a ratio of 17 to 1 often prevails. On the other hand, at certain points a proper average ratio of snowfall to water would be about 6 to 1. In an article in the Monthly Weather Review for May, 1901, Mr. W. A. Bentley, of Nashville, Vt., who has made a study of snow crystals for over twenty years and has more than 800 photographs, no two alike, states that "the temperature and humidity of the air at the earth's surface is a much less important factor than is generally supposed in determining the form and size of the crystal."

Much has been learned, however, of the conditions tending to modify their forms after the nuclear form is once recognized. These conditions are chiefly the character of the cloud strata, the character of the storm and the initial and subsequent movement of the crystal within the cloud.

## SNOWFALL IN THE SIERRA (IN INCHES AND TENTHS).

## BOCA.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1878.....	35.7	65.0	8.5	13.0	0.0	0.0	0.0	0.0	0.5	1.5	1.8	0.0	126.0
1879.....	27.0	4.0	35.5	9.0	3.5	0.0	0.0	0.0	0.0	2.0	0.0	20.0	101.0
1880.....		30.0	29.0	62.0	1.0	0.0	0.0	0.0	0.0	0.0			
1881.....				0.0						1.0	12.0	10.0	
1882.....	39.0	36.0	102.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0	9.0	6.0	202.0
1883.....	3.5	22.0	7.0	9.0	6.0	0.0	0.0	0.0	0.0	13.5	5.0	6.0	72.0
1884.....	46.0	63.0	22.0	19.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	8.0	160.0
1885.....	10.0	1.0	0.0	15.0	0.0	0.0	0.0	0.0	0.0	0.0	11.0	0.5	37.5
1886.....	43.5	7.0	44.0	13.0	0.0	0.0	0.0	0.0	0.0	7.0	7.0	4.0	125.5
1887.....	16.0	127.0	0.0	18.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	27.0	191.0
1888.....	28.0		20.0	4.0		0.0	0.0	0.0	0.0	0.0	4.0	9.5	
1889.....	10.5	6.0	25.5	3.0	39.0	0.0	0.0	0.0	0.0	0.0	9.0	143.5	241.5
1890.....	146.0	54.0	26.0	6.0	0.0	0.0	0.0	0.0	0.0	7.0	0.0	34.5	273.5
1891.....	12.5	45.0	13.0	17.0		0.0	0.0	0.0	0.5	0.0	0.5		
1892.....	7.0	26.0	17.0	11.0	12.0	0.0	0.0	0.0	0.0	0.0	16.0	23.0	117.0
1893.....	22.0	79.0	13.0	16.0	9.0	0.0	0.0	0.0	0.0	0.5	3.2	16.0	163.7
1894.....	46.0	75.5	0.0	10.0	0.8	0.0	0.0	0.0	0.0	0.0	5.0	113.0	255.3
1895.....	33.0	7.0	4.5	7.0	1.0	0.0	0.0	0.0	T.	0.0	7.0	15.5	125.0
1896.....	1.5	5.0	31.5	62.0	6.0	0.0	0.0	0.0	0.0	0.0	1.0	11.0	113.0
1897.....	22.0	63.5	33.5	1.0	0.0	0.0	0.0	0.0	0.0	3.0	5.0	15.0	193.0
1898.....	15.0	29.0	25.0	12.0	3.5	0.0	0.0	0.0	0.0	8.0	7.0	7.0	106.5
1899.....	63.0	13.5	40.0	8.0	21.5	0.0	0.0	0.0	0.0	29.0	6.0	33.0	224.0
1900.....	34.0	6.0	33.0	26.0	6.0	0.0	0.0	0.0	0.0	2.0	33.0	37.0	132.0

## EMIGRANT GAP.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1878.....	95.0	123.5	17.5	27.0	0.0	0.0	0.0	0.0	0.5	5.0	1.0	6.5	276.0
1879.....	72.0	36.5	121.0	77.3	8.0	0.0	0.0	0.0	0.0	24.0	24.0	63.5	426.3
1880.....	101.0	93.8	97.5	201.0	34.2	0.0	0.0	0.0	0.0	0.0	8.0	113.5	649.0
1881.....	35.0	11.0	54.0	3.0	0.0	0.0	0.0	0.0	0.0	6.5	24.0	17.0	150.5
1882.....	55.8	94.0	166.0	26.0	1.0	0.0	0.0	0.0	6.0	60.0	21.5	30.0	460.3
1883.....	4.0	40.0	25.0	14.0	33.0	0.0	0.0	0.0	0.0	9.0	12.0	24.2	161.2
1884.....	32.2	102.0	64.0	43.0	0.0	0.0	0.0	0.0	0.0	6.0	0.0	36.8	339.0
1885.....	14.5	0.0	0.0	12.0	2.0	2.0	0.0	0.0	0.0	0.0	36.0	1.0	67.5
1886.....	63.0	16.0	69.0	75.0	0.5	0.0	0.0	0.0	0.0	15.0	4.0	6.0	143.5
1887.....	21.5	183.0	7.0	24.0	3.0	0.0	0.0	0.0	0.0	0.0	15.0	77.0	335.5
1888.....	36.0	1.0	48.0	19.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	25.0	132.0
1889.....	11.0	11.0	29.0	12.0	50.0	0.0	0.0	0.0	0.0	0.0	6.5	175.0	294.5
1890.....	169.0	93.0	63.0	14.0	14.0	0.0	0.0	0.0	0.0	2.0	0.0	44.0	409.0
1891.....	17.0		20.0	28.0	7.0	0.0	0.0	0.0	0.0	0.0	0.0	77.0	
1892.....	41.5	15.0	57.0	12.0	35.0	2.0	0.0	0.0	0.0	3.0	70.0	24.0	259.5
1893.....	35.0	54.0	73.0	56.0	6.0	0.0	0.0	0.0	0.0	0.0	12.0	0.0	236.0
1894.....	101.0	155.0	13.0	26.0	16.0	0.0	0.0	0.0	0.0	0.0	9.0	0.0	325.0
1895.....	179.0	14.0	5.0	16.0	12.0	0.0	0.0	0.0	0.0	0.0	17.0	35.0	273.0
1896.....	14.0	T.	30.0	115.0	12.0	0.0	0.0	0.0	0.0	10.0	T.	16.0	247.0
1897.....	27.0	73.0	123.0	14.0	0.0	0.0	0.0	0.0	0.0		10.0		
1898.....	16.0	41.0	12.0	11.0	2.0	0.0	0.0	0.0	0.0	14.0	15.0	4.5	115.0
1899.....	105.0	25.5	106.0	30.0	12.0	0.0	0.0	0.0	0.0	10.1	12.0	47.0	347.6
1900.....	2.0	20.0	53.0	33.0	T.	0.0	0.0	0.0	0.0	4.0	33.0	25.0	175.0

CLIMATOLOGY OF CALIFORNIA.

SNOWFALL IN THE SIERRA (IN INCHES AND TENTHS)—Continued

SUMMIT

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1878.....	100 0	115 0	30 0	24 0	16 0	0 0	0 0	0 0	4 2	12 1	8 0	6 0	315 3
1879.....	77 5	57 0	209 0	45 2	25.5	1 0	0 0	T	0 0	42 0	56 0	133 0	646 2
1880.....	66 0	75 0	89 0	298 0	24 0	0 0	0 0	0 0	0 0	0 0	5 0	62 0	619 0
1881.....	45 0	16 0	15 0	10 0	0 5	0 0	0 0	0 0	6 0	26 0	30 5	43 0	192 0
1882.....	65 5	90 0	193 0	32 5	6 0	0 0	0 0	0 0	7 5	27 5	39 5	49 5	511 0
1883.....	10 0	26 0	72 0	34 0	33 0	0 0	0 0	0 0	0 0	9 5	12 0	32 0	228 5
1884.....	76 0	127 0	91 0	126 0	2 0	6 0	0 0	0 0	11 0	21 0	0 0	94 0	554 0
1885.....	14 0	5 0	1 0	38 0	10 0	8 0	0 0	0 0	0 0	0 0	136 0	30 0	242 0
1886.....	131 0	14 0	78 0	64 0	9 5	0 0	0 0	0 0	0 0	31 0	17 0	34 0	378 5
1887.....	56 0	207 0	14 0	58 0	5 0	0 0	0 0	0 0	0 0	T	15 0	116 0	471 0
1888.....	92 0	7 0	80 5	21 0	4 0	9 5	0 0	0 0	0 0	0 0	16 5	39 0	269 5
1889.....	10 0	15 0	95 5	19 0	63 0	3 0	0 0	0 0	0 0	24 0	61 0	185 0	475 5
1890.....	192 0	116 0	147 0	26 0	25 0	0 0	0 0	0 0	0 0	0 0	0 0	74 0	580 0
1891.....	15 0	138 0	51 0	46 0	11 0	0 0	0 0	0 0	0 0	0 5	3 0	119 0	383 5
1892.....	40 0	34 0	74 0	45 0	63 0	2 0	0 0	0 0	0 0	6 0	88 0	95 0	447 0
1893.....	79 0	108 0	145 0	92 0	21 0	0 0	0 0	0 0	3 5	3 0	36 0	60 0	547.5
1894.....	155 0	152 5	34 0	43 0	24 0	0 0	0 0	0 0	5 0	29 0	10 0	245 0	697 5
1895.....	258 0	42 0	47 0	25 0	24 0	0 0	0 0	0 0	2 0	0 0	14 0	33 0	495 0
1896.....	105 0	7 0	97 0	182 0	54 0	0 0	0 0	0 0	4 0	9 0	123 0	41 0	622 0
1897.....	40 5	143 5	180 0	12 5	0 0	7 0	0 0	0 0	0 5	25.0	26 5	42 0	477 5
1898.....	40 0	30 0	52 0	8 0	29 0	9 0	0 0	0 0	0 0	34 0	25 0	36 0	263 0
1899.....	127 0	52 0	157 5	17 5	32 0	0 0	0 0	0 0	0 0	89 0	29 0	79 0	533 0
1900.....	41 0	38 0	79 0	42 0	9 0	0 0	0 0	0 0	1 5	21 0	60 0	15 0	306 5

TRUCKEE

1878.....	46 0	110 0	16 0	8 0	0 0	0 0	0 0	0 0	1 0	2 0	8 0	5 0	196 0
1879.....	53 0	2 0	32 5	20 0	4 0	0 0	0 0	0 0	0 0	14 0	16 8	45 5	137 8
1880.....	29 5	46 5	46 5	124 0	6 5	0 0	0 0	0 0	0 0	0 0	4 5	80.0	337 5
1881.....	31.5	...	18 0	3 0	0 5	0 0	0 0	0 0	2.0	5 0	27.0	20 5	-----
1882.....	62 0	49 5	120 5	18 5	0 0	0 0	0 0	0 0	0 0	0 0	6 0	8 0	264 5
1883.....	10 5	30 5	10 0	21 0	9 5	0 0	0 0	0 0	0 0	15 0	25 0	16 0	137 5
1884.....	66 5	112 0	44 5	37 0	0 0	0 0	0 0	1 0	0 0	4 0	0 0	24 0	239.0
1885.....	13 0	2 0	0 0	14 0	0 0	0 0	0 0	0 0	0 0	0 0	34 0	0 0	68 0
1886.....	47 0	5 0	29 0	14 0	0 0	0 0	0 0	0 0	0 0	8.5	11 0	8 0	122 5
1887.....	23 0	122 5	2 0	20 0	0 0	0 0	0 0	0 0	0 0	0 0	8 0	43 0	213 5
1888.....	23 5	0 0	31 5	3 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	15 0	73 0
1889.....	8 0	14 0	25 0	10 0	45 0	0 0	0 0	0 0	0 0	0 0	10 8	132 0	244 8
1890.....	162 0	89 0	38 0	2 5	5 0	0 0	0 0	0 0	0 0	0 0	0 0	33.0	332 5
1891.....	12 2	67 2	28 0	20 5	4 0	0 0	0 0	0 0	0 0	0 0	0 0	50 2	132 1
1892.....	26 5	12 0	30 0	19 5	22 0	1 5	0 0	0 0	0 0	T	27 0	23 0	161 5
1893.....	23 0	75 0	43 0	33 0	13 5	0 0	0 0	0 0	0 0	0 2	5 0	17.0	209 5
1894.....	77 0	109 5	22 5	20 0	0 0	T	0 0	0 0	0 0	0 0	6 0	139 5	374 5
1895.....	107.0	16 0	15 0	5 0	10 0	0 0	0 0	0 0	0 0	0 0	5 0	29 0	137 0
1896.....	16 5	4 0	39 0	90 0	3.0	0 0	0 0	0 0	0 0	4 0	3 5	18 0	173 0
1897.....	23 5	68 0	95 0	3 0	0 0	0 0	0 0	0 0	0 0	0 0	4 0	19 5	213 0
1898.....	10 5	34 0	20 5	2.5	3 0	0 0	0 0	0 0	4 0	0 0	20 0	15 0	109 5
1899.....	78 0	27 0	54 0	0 0	0 0	0 0	0 0	0 0	0 0	56 0	13 0	18 0	246 0
1900.....	6 0	8 0	42 0	12 0	8 0	0 0	0 0	0 0	0 0	4 0	25 0	27 0	132 0



## NORTHERN SIERRA NEVADA.

By Mr. J. A. EDMAN, E. M.

The relation of snowfall to water supply can not be predicated upon the bare statement of precipitation and depth of snow alone, as so many other factors must be taken into consideration. To refer to the reports of observers to the Weather Bureau: What does an inch of snow stand for? It may mean all the way from one-ninth to one-fourth of an inch of water. Again, the absolute water contents of the settled snow depends not alone on its depth, but its relative compactness at the time of measurement, and may vary from one-seventh to one-third of an inch of water for one inch of snow.

The only conditions in the northern part of the Sierra Nevada under which a heavy snowfall insures a steady water supply are as follows: First, early rains beginning in October and gradual enough to soak into the surface without running off in sudden floods; second, abundant snows in December and January, with occasional rains, so that the snow may settle and become compact, and freezing of the surface soil prevented; third, occasional snowstorms during February and March, and an early but not too warm spring. Heavy precipitation and snowfall under other conditions do not insure an abundant water supply, as was well illustrated during the season 1889-90, when the precipitation at Edmanton reached 137.35 inches, and the depth of solid snow on the 15th of March attained 14 feet. Elaborate computations of the precipitation for that season in the Feather River basin, in connection with a record of flow at the Golden Gate mine near Oroville, showed that only 30 per cent of the water estimated passed off by the river during the spring and summer months. In this instance the spring of 1890 was marked by a very high temperature, and the first deep snows of 1889 fell on bare and frozen ground. The general water supply during that season was but little above the average. At this altitude ( $\pm$ 750 feet) and section of country it takes nearly 20 inches of water to fill the surface soil and start the deeper springs running, and even more after a very hot and dry summer.

The above-mentioned facts are well illustrated by the weather conditions during the seasons 1899-1900 and 1900-1901, as will appear from the subjoined tables:

1899-1900.			1900-1901.		
	Total precipitation.	Snow.		Total precipitation.	Snow.
October .....	15.88	19.0	August and September .....	0.25	0
November .....	13.09	6.0	October .....	12.51	0
December .....	11.89	22.0	November .....	13.13	20.0
January .....	10.99	0	December .....	7.70	22.0
			January (to 26th) .....	16.75	94.0
	51.85	47.0		50.34	136.0

An inspection of the above table will show the precipitation about equal for the two seasons, but the snowfall of January, 1901, far in excess of that of the corresponding month of 1900. The table, however, does not show that the conditions precedent during this season were specially favorable in contrast with the previous season, as the storms of October, 1899, were concentrated in a few days and the water passed off rapidly in injurious floods, while the rainfall of October, 1900, was well distributed over the whole month and largely seeped into the ground. The rains of December, 1899, fell on frozen ground and largely ran off, while in December, 1900, the thoroughly saturated ground received a cover of snow, to be reenforced in January, 1901, by heavy snows, now (January 26) averaging 4 feet in depth at this station, which acted upon by the warm surface soil feeds the streams independent of the general temperature conditions. Given a fair supply of snow during February and March it is reasonable to predict a good water supply during the summer of 1901.

## AT EDMANTON STATION

By Mr J A EDMAN, Voluntary Observer

The months of February and March, 1901, present a marked contrast to each other in regard to precipitation and also in snowfall, the record being as follows:

	Precipitation (inches)	
	February	March
Water, measured from rain . . . . .	9 47	0 68
Water, measured from snow . . . . .	5 89	4 26
Total . . . . .	15 36	4 94

The preponderance of rain during February is notable, as the mean temperature for the month was  $35.2^{\circ}$ , as compared with  $40.1^{\circ}$  for March. The rains of February having been almost continuous for eight days, and accompanied by strong winds and a mean temperature during the storm period of  $40.3^{\circ}$ , induced a rapid melting of the snow, and as a result the depth of snow (70 inches) at the beginning of the rainstorm was, at its close, reduced to an average of 40 inches. This reduction in the volume of the snow I have estimated as equivalent to 7 inches of water, making a run-off during a little more than ten days of 16.47 inches of water, and causing proportionate floods in the mountain streams.

The precipitation during March was much below the normal, and being mainly in snow, added 10 inches to the depth up to the 15th, which, although reenforced by a light snowstorm on the 27th, was reduced during the prevailing clear and comparatively mild weather of the latter half of the month to an average of 30 inches by the 1st of April. This depth of snow is roughly estimated, as great variation occurs according to exposure to sun and wind, many southern slopes now presenting large bare spaces, while drifts 5 feet deep may be seen on northern declivities and in sheltered spots in the canyons.

Ever since the high water of February the streams in this section of the Sierra have furnished a constant and but slightly varying water supply, which is being utilized by the miners, and which is apt to continue, and even to increase, during April and May, dependent on the temperature. The precipitation for the season, up to date, at this station, is 70.68 inches

The depth of snow on April 1, within a radius of 6 miles from this station, may be estimated as follows: In the zone below 3,500 feet altitude, little or no snow is found. From 3,500 to 4,000 feet, but little is seen on southern exposures, but an average of 20 inches on northern slopes and in the hollows. From 4,000 to 5,000 feet, about one-half of southern exposures are bare, and the snow there remaining does not exceed 20 inches in depth, while the northern slopes average fully 35 inches in depth. From 5,000 to 6,000 feet, bare spots occur on wind-swept southern exposures to an extent of 25 per cent in area, while the average depth of the whole zone may be given at 50 inches. From 6,000 to 7,000 feet, a few bare spots occur on windy points, while over the whole zone the snow probably averages fully 70 inches in depth. Three inches of the old snow may be estimated equivalent to 1 inch of water. The rains of February extended above the 7,000 feet zone in this region. The later snows have not reached below the 3,500 feet limit.

So far the outlook for a long-continued and regular water supply within the Feather River drainage area is very promising, providing normal temperatures prevail during April and May.

## CALAVERAS COUNTY.

By Mr. C. E. PRINDLE, Voluntary Observer.

The snowfall in the mountains of eastern and northern Calaveras County is several feet short of the average up to five and six years ago. The snows this winter have been light, and the rains have extended higher into the mountains than usual. The earth contains more springs and water at this date than it has for five years past. There is more water in the Calaveras River and all branches of the Mokelumne River (except the North Fork, which heads in Blue Lakes) than for several years past at this date, it being mostly rain water and not water from the snows. Dependence is not placed as much on the snowfall for a summer supply of water as in former years, for the reason that great forest fires have been so destructive to timber and undergrowth of late years that the snows do not remain on the ground long, but disappear from a month to six weeks earlier than formerly. Spring rains are more to be depended upon than snow for a summer supply of water.

Parties who have to-day returned from the higher range of mountains state that the snowfall is very light, in many localities there being none at all, where last year at this date there was 4 feet. Snow has fallen several times, but being followed by rain it did not remain long on the ground.

## LAPORTE.

The following record of snowfall at Laporte, Plumas County (elevation 5,000 feet), was made by Mr. Charles W. Hendel, voluntary observer. The record shows a yearly average of 299 inches. The snowfall for January, 1901, was 96.5 inches:

Year.	Jan.	Feb.	Mar.	Apr.	May.	Oct.	Nov.	Dec.	Total.	Year.	Jan.	Feb.	Mar.	Apr.	May.	Oct.	Nov.	Dec.	Total.
1895.....	176.0	17.5	48.0	24.0	19.0	0.0	28.0	43.0	850.5	1899.....	114.1	26.9	117.8	25.3	12.7	27.3	22.0	52.9	899.0
1896.....	57.0	8.0	73.0	141.0	25.5	23.0	12.0	31.0	370.5	1900.....	18.0	22.9	52.9	28.9	1.0	6.5	37.1	28.2	195.5
1897.....	45.0	90.0	111.0	18.0	0.0	19.5	8.0	16.0	305.5	Average.	72.6	37.8	69.0	41.4	10.3	15.4	20.1	30.8	299.0
1898.....	25.5	61.5	16.0	11.5	3.5	16.4	15.5	13.5	172.9										

<sup>a</sup> Includes 7 inches in June and 2.5 in September.

## CUYAMACA, 1888-1900.

By Mr. G. H. NELSON, Voluntary Observer.

Year.	Jan.	Feb.	Mar.	Apr.	May.	Oct.	Nov.	Dec.	Total.	Year.	Jan.	Feb.	Mar.	Apr.	May.	Oct.	Nov.	Dec.	Total.
1888.....	36.0	4.5	17.0					0.5	58.0	1895.....	25.5						2.0		27.5
1889.....	6.5	23.0	2.0	0.5					32.0	1896.....			48.0						48.0
1890.....	14.0	38.0				0.5			42.5	1897.....		24.0						8.0	32.0
1891.....		1.5	2.0	5.0					8.5	1898.....	24.0		9.0					16.0	49.0
1892.....								1.0	1.0	1899.....	1.0	12.0	4.8						17.8
1893.....		12.0	36.0				11.0		59.0	1900.....				3.0					3.0
1894.....	23.0	5.0	26.0		0.5				54.5										

Average for thirteen years, 33 inches.

## CLIMATOLOGY OF CALIFORNIA.

## PRECIPITATION AT HIGH LEVELS.

[From records of U S Geological Survey]

## CAMPO, SAN DIEGO COUNTY

[Latitude, 32° 37', longitude, 116° 30' Elevation, 2,543 feet]

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1877..	...	...	2 29	1 08	0 91	0 00	0 50	0 00	0 00	0 35	...	2 44	...
1878..	1 79	5 45	1 84	5 75	0 41	0 00	2 32	0 01	0 00	0 31	0 55	1 29	19 72
1879..	2 18	1 32	0 60	2 01	0 00	0 00	0 00	0 00	0 00	0 00	3 00	2 23	11 34
1880 ..	3 00	2 15	3 56	4 00	0 00	0 00	0 12	0 41	0 01	0 68	0 85	4 85	19 63
1881 ..	1 74	0 58	5 00	1 52	0 12	0 04	0 07	1 27	0 02	0 78	0 11	0 24	11 39
1882..	3 10	4 57	1 01	1 10	0 18	0 26	...	0 53	0 02	...	...	...	...
1889 ..	...	4 65	4 00	...	0 45	0 10	...	2 50	0 50	1.10	1 67	9 34	...
1890 ..	2 40	7 25	1 69	...	0 90	...	2 26	2 67	1 30	...	0 95	...	...
1891 ..	0 00	13 30	0 50	1 20	0 75	0 00	0 00	16 10	0 00	0 00	0 25	[3 21]	[35 31]
1892 ..	0 75	4 55	3 30	1 25	2 75	...	...	...	...	...	...	...	...
1893 ..	3 55	3 65	7 19	1 54	0 41	0 00	0 00	0 00	0 57	0 11	3 38	2 08	22 48
1894 ..	5 89	5 83	1 01	0 80	4 38	1 26	0 00	0 00	...	...	...	...	...
1900 ..	2 65	0 10	0 55	2 07	1 04	0 10	0 00	0 00	0 05	0 28	4 47	0 00	...
1901 ..	2 03	8 22	0 69	0 54	1 13	0 00	0 61	0 63	0 00	1 02	0 43	0 23	...
Mean ..	2 42	4 74	2 37	1 90	0 96	0 15	0 53	1 86	0 25	0 46	1 57	2 59	19 80

## CROCKERS, TUOLUMNE COUNTY

[Latitude, 37° 48', Longitude, 119° 53' Elevation, 4,453 feet]

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1896 ..	...	...	...	...	...	...	...	3 10	0 14	2 30	9 18	5 41	...
1897 ..	6 56	15 97	21 80	1 33	0 00	0 75	0 00	0 00	0 45	6 09	2 70	3 80	59 45
1898 ..	2 60	7 15	3.74	1 50	3 74	0 00	0 00	0 00	1 58	1 87	1 85	2 12	26 15
1899 ..	8 32	1 00	15 89	1.50	0 15	1 65	0 00	0 00	0 00	8 10	7 45	11 38	55 54
1900 ..	5 98	1 18	4 28	3 56	1 80	0 47	0 00	0 00	0 62	9 71	17 43	1 39	46 42
1901 ..	16 99	15 71	3 03	6 35	3 31	0 00	0 00	0 00	3 28	4 59	3 90	2 50	60 16
Mean ..	9 29	8 20	9 75	2 85	1 90	0.57	0 00	0 52	1.01	5 44	7 03	4 43	50 84

## CUYAMACA, SAN DIEGO COUNTY

[Latitude, 32° 58', longitude, 115° 35' Elevation, 4,800 feet]

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1897..	6 32	8 14	8 56	0 22	0 38	0 00	0 00	0 00	0 36	5 09	1.07	2 46	32 60
1898..	5 47	1 97	4 06	1 24	5 97	0 00	0 00	1 32	0 00	0 00	0 88	0 96	21 87
1899..	7 02	1 53	7 23	0 98	0 47	2 96	0 04	T	0 00	4 51	3 45	2 49	30 68
1900..	3 62	0 26	2 51	6 69	4 03	0 10	0 23	T	0 92	0 74	11 97	0 04	31 16
1901..	8 17	13 26	2 32	1 24	3 87	0 00	T	0 09	0 08	1 94	1 48	0 52	32.97
1887..	...	...	...	...	...	...	...	...	0 00	0 78	3 64	6 00	...
1888..	3 35	3 12	4 12	0 21	0 00	0 00	0 93	0 04	0 21	3 82	8 33	13 30	...
1892..	...	...	...	...	...	...	...	...	...	...	2 87	3 76	...
1893..	5 55	9 13	15 60	1 00	1 00	0 00	1 20	0 30	0 00	1 90	3 30	2 75	...
1894 ..	2 05	2 05	0 00	0 00	1 00	0 50	0 00	0 50	0 30	0 00	0 00	12 80	...
1895 ..	28 43	4 60	5 89	1 10	1 16	0 00	0 00	0 00	3 00	1 03	6 01	1 66	...
1896 ..	5 77	0 20	3 01	1 78	0 92	0 00	1 29	0 87	1 06	4 93	3 45	3 74	...
Mean ..	4 98	4 43	5 33	1 45	1 88	0.36	0 37	0 31	0 54	2.25	3 87	4 21	29 98

## DESCANSO, SAN DIEGO COUNTY

[Latitude, 32° 50', longitude, 116° 40' Elevation, 3,500 feet]

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1896 ..	2 93	0 10	8 04	1 14	0 17	0 00	0 30	1 38	0 03	2 71	2 12	2 43	21 35
1897 ..	6 48	6 27	5 21	0 16	0 21	0 01	0 62	0 04	0 56	2 83	0 40	2 90	25 69
1898 ..	5 28	0 89	4 11	0 90	2 35	0 00	0 00	0 83	0 00	0 00	0 35	1 00	...
1899 ..	3 49	1 69	2 73	0 25	1 45	...	0 15	0 38	...	...	0 25	1 06	...
1900 ..	4 00	0 75	1 25	4 25	2 69	0 06	0 00	T.	0 25	0 63	6 50	0 15	20 53
1901 ..	3 25	11 00	1 40	0 57	1 53	0 00	T	0 73	T	1 25	0 87	0 12	...
Mean ..	4 24	3 45	3 79	1 21	1 40	0 01	0 20	0 57	0 17	1 48	1 75	1 28	19 55

α Cloud-burst, rain gauge washed away and record incomplete

## PRECIPITATION AT HIGH LEVELS—Continued.

## HOLCOMB CREEK, SAN BERNARDINO COUNTY.

[Latitude, 34° 18'; longitude, 116° 58'. Elevation, 5,220 feet.]

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1896.....	10.66	0.61	4.86	0.62	0.00	0.00	0.00	0.00	0.00	0.00	1.66	0.41	18.22
1896.....	1.56	T.	3.24	1.02	0.25	0.00	0.00	0.47	0.00	1.70	1.05	1.82	11.11
1897.....	3.35	7.89	3.42	0.00	0.11	0.20	0.00	0.00	0.38	3.32	.....	.....	.....
1898.....	3.05	0.52	1.27	0.10	1.46	0.00	0.00	0.66	0.00	0.03	0.57	0.48	8.11
1899.....	0.38	0.21	1.14	1.25	1.20	.....	.....	.....	.....	.....	.....	.....	.....
1900.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mean.....	3.68	1.85	2.79	0.60	0.60	0.05	0.00	0.28	0.10	1.26	1.13	0.90	13.24

## LITTLE BEAR VALLEY, SAN BERNARDINO COUNTY.

[Latitude, 34° 15'; longitude, 117° 10'. Elevation, 5,150 feet.]

1893.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.21	1.49	2.55	7.61	.....
1894.....	2.48	2.25	3.16	0.62	1.34	0.12	0.04	0.31	0.52	0.88	0.00	20.12	31.34	.....
1895.....	15.27	2.01	8.82	1.31	0.00	0.00	0.00	0.00	0.00	0.00	2.65	1.75	31.81	.....
1896.....	2.38	T.	4.21	1.72	0.47	0.00	0.00	0.10	0.00	2.30	1.38	1.98	14.54	.....
1897.....	5.16	11.74	10.17	0.08	0.15	0.20	0.00	0.00	0.46	4.10	0.76	1.20	33.97	.....
1898.....	3.80	1.38	2.49	0.25	4.56	.....	0.00	.....	.....	T.	0.62	0.74	.....	.....
1899.....	1.39	0.43	3.42	3.11	4.63	.....	.....	.....	.....	.....	.....	.....	.....	.....
1900.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mean.....	5.08	2.97	5.38	1.17	1.86	0.08	0.01	0.10	0.44	1.36	1.33	5.57	25.36	.....

## MORSE'S HOUSE, SAN BERNARDINO COUNTY.

[Latitude, 34° 12'; longitude, 117° 12'. Elevation, 5,350 feet.]

1893.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.25	2.44	2.75	14.73	.....
1894.....	4.78	3.93	5.00	1.37	2.08	0.60	0.02	0.74	0.67	0.47	0.00	26.77	46.43	.....
1895.....	13.00	5.85	12.74	2.91	0.00	0.00	0.00	0.00	0.00	0.00	4.18	3.11	46.69	.....
1896.....	5.95	0.08	7.90	2.63	0.89	0.00	0.00	0.46	0.00	3.83	1.96	2.73	26.43	.....
1897.....	9.34	20.14	15.61	0.15	0.18	0.40	0.00	0.00	0.73	5.08	.....	1.85	.....	.....
1898.....	0.87	2.96	4.22	0.70	8.27	.....	0.08	.....	.....	0.34	0.74	1.28	.....	.....
1899.....	2.20	0.44	3.83	5.81	8.64	.....	.....	.....	.....	.....	.....	.....	.....	.....
1900.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mean.....	7.77	5.57	8.22	2.26	3.34	0.25	0.02	0.30	0.33	2.03	1.93	3.41	40.43	.....

## MOUNT LOWE, LOS ANGELES COUNTY.

[Latitude, 34° 15'; longitude, 118° 07'. Elevation, 3,200 feet.]

1896.....	2.85	0.10	4.10	0.60	0.30	0.00	0.00	0.10	0.00	2.38	1.51	2.11	14.05	.....
1897.....	6.42	7.47	6.67	0.19	0.87	0.10	0.15	0.00	0.00	2.57	0.40	0.22	25.06	.....
1898.....	1.55	2.22	1.65	2.70	2.17	0.00	0.00	0.00	0.25	0.30	0.00	0.98	11.82	.....
1899.....	3.29	0.00	3.40	0.20	1.90	0.40	0.00	0.00	3.00	2.85	.....	.....	.....	.....
1900.....	.....	.....	2.90	2.15	4.05	0.40	T.	0.00	0.25	1.40	11.71	0.00	.....	.....
Mean.....	3.53	2.45	3.74	1.17	1.86	0.18	0.03	0.02	0.10	1.90	3.40	0.88	19.21	.....

## MUTAH FLAT, LOS ANGELES COUNTY.

[Latitude, 34° 38'; longitude, 119° 03'. Elevation, 4,850 feet.]

1893.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.70	0.00	4.10	.....	.....
1894.....	0.54	0.54	0.30	0.13	0.79	0.00	0.00	0.00	0.00	0.85	0.00	7.38	10.48	.....
1895.....	9.80	0.78	2.95	0.00	0.00	0.00	0.00	0.00	0.00	0.65	1.60	1.10	16.88	.....
1896.....	.....	0.00	4.79	3.50	0.52	0.00	0.30	0.00	0.00	1.75	1.30	2.80	.....	.....
1897.....	9.10	3.50	3.59	0.00	0.00	0.00	0.30	0.00	0.00	1.75	0.00	0.15	18.39	.....
1898.....	0.60	1.00	0.80	0.00	1.02	0.00	0.00	0.00	0.00	2.00	0.00	0.40	5.82	.....
1899.....	2.30	0.00	2.70	0.50	0.00	0.00	0.00	0.00	0.00	2.00	1.30	2.25	.....	.....
1900.....	2.80	0.00	1.95	0.40	1.80	0.00	0.00	0.00	0.00	0.00	5.00	0.00	.....	.....
1901.....	7.00	4.60	0.25	1.60	0.58	0.00	0.00	0.00	0.00	2.85	0.65	0.00	.....	.....
Mean.....	4.59	1.30	2.17	0.77	0.59	0.00	0.08	0.00	0.25	1.23	1.12	2.01	14.16	.....

CLIMATOLOGY OF CALIFORNIA.

PRECIPITATION AT HIGH LEVELS—Continued.

PALMDALE HEAD WORKS, LOS ANGELES COUNTY

[Latitude, 34° 25', longitude, 118° 08' Elevation, 3,299 feet ]

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1896						0 00	0 25	1 35	0 32	1 42	0 43	0 98	.
1897	3 78	3 71	1 31	0 04	0 32	0 00	0 03	1 57	T	0 86	0 00	0 14	.
1898	2 38	0 07	0 90	0 00	0 21	0 00	0 02	0 05	0 00	0 00	T	0 87	...
1899	1 00	0 31	0 97	0 00	0 00	0 00	0 00	0 00	0 00	1 28	0 27	0 32	4 15
1900	0 65	0 00	0 80	0 57	0 76	0 00	0 00	0 00	0 00	0 20	1 79	0 00	4 77
1901	1 34	4 50	0 38	0 15	T	0 00	0 00	0 38	T	0 32	0 04	0 00	...
Mean	1 83	1 72	0 87	0 15	0 26	0 00	0 05	0 55	0 05	0 68	0 42	0 38	6 96

SECOND GARROTTE, TUOLUMNE COUNTY

[Latitude, 37° 49', longitude, 120° 12' Elevation, 2,900 feet ]

1898	1 25	4 52	8 27	2 00	3 50	0 00	0 00	0 00	0 63	0 75	0 75	1 00	23 67
1899	8 00	11 00	16 00	9 00	1 00	1 48	0 00	0 00	0 00	2 00	0 00	18 50	59 98
1900	4 00	0 00	0 00	1 50	0 00	3 50	0 00	0 00	0 25	0 00	18 00	5 00	32 25
1901	10 00	1 00	5 50	6 25	0 50	0 00	0 00	0 00	0 00	1 00	1 75	2 75	28 75
1897	1 00	13 75	1 25	5 50	0 00	0 00	0 00	0 00	1 00	0 00	2 00	7 00	31 50
1898	7 75	1 50	3 00	1 25	1 25	0 25	0 00	0 00	0 50	0 00	5 00	4 25	24 75
1899	0 50	1 00	9 75	0 50	5 75	0 00	0 00	0 00	0 00	6 50	5 75	22 00	51 75
1900	15 00	6 75	7 25	2 00	1 75	0 00	0 00	0 25	2 27	0 00	0 00	9 00	54 27
1901	2 00	11 00	5 00	3 50	0 25	0 00	0 00	0 00	0 00	0 25	0 00	11 25	36 25
1902	2 25	3 25	7 00	2 00	6 25	0 00	0 00	0 00	0 25	1 25	10 00	8 75	41 00
1903	6 00	7 25	11 25	2 50	0 00	0 00	0 00	0 00	0 50	0 25	3 00	4 00	34 75
1904	10 50	10 75	2 25	1 25	3 75	1 00	0 00	0 00	2 00	2 00	0 50	18 00	52 00
1905	13 00	4 25	8 75	2 00	1 50	0 00	0 00	0 00	0 00	0 00	1 75	2 75	34 00
1906	12 00	0 00	5 50	7 25	0 25	0 00	0 00	2 50	0 00	3 00	6 00	4 50	41 00
1897	4 00	10 75	9 01	0 53	T	T	0 00	0 00	T	2 75	1 00	2 50	30 54
1898	2 75	6 00	2 50	0 25	2 50	0 00	0 00	0 00	2 00	1 50	1 50	1 00	20 00
1899	6 75	1 00	14 00	0 50	1 00	0 00	0 00	0 00	0 00	6 75	6 75	6 00	42 75
1900	5 25	1 25	3 75	4 00	1 50	0 00	0 00	0 00	0 25	5 00	14 00	1 50	36 50
1901	11 00	17 75	1 25	4 00	1 00	0 00	0 00	0 00	2 25	2 25	2 00	2 00	33 50
Mean	6 47	6 28	5 85	2 94	1 67	0 33	0 00	0 14	0 63	1 86	4 20	6 93	37 83

UPPER LAKE,<sup>a</sup> VENTURA COUNTY

[Latitude, 34° 41', longitude, 119° 03' Elevation, 4,900 feet ]

1891								0 00	0 95	0 62	0 71	7 35	...
1892	3 93	2 50		2 84	3 71	0 49	0 00	0 00	T	1 17			...
1893	4 08	5 19	5 47	2 37	1 04	0 00	T	0 00	0 85	0 47	4 83	2 82	27 12
1894	10 43	6 21	1 80	1 46	1 02	1 12	0 00	T	0 53	2 05	1 13	11 62	37 37
1895	14 92	4 15	3 20	1 41	1 39	0 00	0 05	T		T			...
1896	11 18	0 80	2 39	6 01	2 07	0 00	T	0 87	0 42	1 04	5 07	6 47	36 32
1897	3 45	6 35	4 58	0 42	0 22	0 97	0 05	0 00	0 08	1 67	2 38	2 61	22 78
1898	0 93	4 57	0 36	0 43	1 90	0 58	0 00	T	0 60	1 01	1 66	1 34	13 38
1899	8 16	0 25	5 59	0 90	1 00	0 05	0 00	0 03	0 00	3 49	0 33	9 79	35 59
1900	3 98	1 31	3 53	2 13	0 81	0 35	T	0 00	0 03	3 96	5 08	3 93	24 81
1901	6 44	4 75	1 06	2 43	0 70	0 00	T	T	1 11	1 09	4 35	2 09	24 02
Mean	6 75	3 61	3 11	2 04	1 39	0 36	0 01	0 09	0 46	1 51	3 50	4 22	27 05

<sup>a</sup>Upper Lake is also the name of a station in Lake County

## FROST.<sup>a</sup>

With the possible exception of the loss occasioned by insect pests, there is probably no one cause of loss so seriously affecting crops in California as frost. Notwithstanding statements sometimes published that certain areas are in the so-called frostless belt, there does not appear good reason for believing that any portion of the State may not be visited by frost.

The losses to the fruit crop, both citrus and deciduous, through frost have been so large that special attention has been given to methods of protecting orchards, and these methods are discussed in detail in the following pages. With citrus fruits the frosts of December, January, and February are to be guarded against, the fruit being ripe and ready for shipment. With deciduous fruits the late spring frosts do the damage. Almonds, apricots, grapes, peaches, and prunes are hurt while in bud, or while the fruit is just setting, by the frosts of March and April. The damage depends, in all probability, as much upon the condition of the tree as the degree and duration of the cold. For example, a sharp frost during the first or second week of April sometimes does less damage if the trees are fairly past the blossoming period than the same frosts would have caused occurring about the middle of March.

Attention is invited to the excellent table prepared by Mr. Samuel H. Gerrish, of Sacramento, giving the dates of first and last light and killing frosts, also the dates of blooming fruit trees in Sacramento from 1869 to 1901.

The protection of gardens, both vegetable and flower, is also important. The particular frosts affecting gardens are the frosts of February, March, and April, and it is pointed out in the succeeding pages that the same general principles used to protect orchards should be followed in the protection of gardens. A clear, still night following thirty-six or forty-eight hours of boisterous north wind is likely to be followed by frost, particularly if the movement of the air in the given locality has been such as to cause a settling of cold, relatively dry air strata in the hollows or depressions of the land. The formation of frost is essentially a problem in air drainage, and if by any means we can prevent streaks, pools, or basins of stagnant, cold, dry air we can largely prevent frost. Frost is the water vapor of the air deposited upon the plant at a temperature below 32° F. The damage to plant life is caused by the falling temperature. The water vapor plays the part of an index only. Indeed, the action of the water vapor is preventive. Dry air at a temperature of 32° F. weighs 563 grains per cubic foot. Vapor of water at 32° F. weighs 2.1 grains per cubic foot at a saturation of 100 per cent. Air at a temperature of 25° F. weighs 572 grains per cubic foot. Given a little time, therefore, on a still, clear night the loss of heat by radiation from the plant surfaces and the ground will bring about a settling of the colder air to the bottom. The ground will be covered with frost, while thermometers 6 feet above the ground will record 34° or 35° F. Vegetables and flowers, therefore, unless grown upon sloping or terraced ground, are at a decided disadvantage compared with tree fruit in the matter of frosts.

### NATURE OF FROST.

It can not be emphasized too clearly that it is the low temperature and not the solidification of the water which does the damage. If there be but little vapor in the air there will be but a light frost apparent, and yet the temperature may be so low as to cause great injury. The so-called hard, dry frost, also called black frost, does, as is well known, even more injury than

<sup>a</sup>Since this article was written a number of orchard-heating devices have been patented by various frost prevention companies in California. Oil fire pots have been tested and it is claimed given very satisfactory results. Gravity oil distillate is used as fuel and about eighty oil pots to the acre will insure protection.

heavy frosts. Water vapor at 25° F. completely saturated weighs 1.6 grains per cubic foot. In the fall from 32° to 25° nearly half a grain per cubic foot, if the saturation were 100 per cent, would be condensed, appearing in visible form as a frost flake. A certain amount of heat was given off in the transformation of this invisible water vapor into ice, and an exactly equal amount of heat (known as the latent heat of vaporization) will be in turn required to change this frost flake back into vapor. We give special attention to this point because it would appear theoretically that the secret of successful protection of garden truck and delicate flowers will be found in this action of water, both in setting free heat at the time when the temperature is falling, and on the other hand in using up heat and thus acting as a retard or brake when the temperature begins to rise quickly.

It is now quite generally believed that as much injury results from the sudden warming up of the dormant and thoroughly chilled flower or vegetable as from the chilling itself. In the work of protecting fruits from frost it has been found very necessary to interpose some screen early in the morning between the sun's rays and the frosted fruit. With flowers and garden truck this can be much more easily accomplished than with fruit. In this respect the gardener has a decided advantage over the orchardist. The following is an excellent statement of how the plant is injured:

#### HOW FROST INJURES PLANTS

Low temperature congeals the watery part of the cell sap and also the intercellular water content of the plant. Within certain limits this is not or may not be injurious, providing the protoplasmic contents of the cell are able to absorb the water and do this before the cell structure collapses as a result of insufficient cell turgor. Frequently the frosting of plants is followed by a sudden rising of temperature, in which case much of the water which was part of the cell sap in the normal condition of the plant escapes through the cell wall into intercellular spaces, or even from the plant entirely, and thus, the protoplasm of the cell being unable to assume its normal condition, becomes disorganized and decomposition follows (Prof E R Lake in the Oregon climate and crop bulletin, July, 1900 )

#### PROTECTION OF ORCHARDS FROM FROST.

During the past five years the Weather Bureau office at San Francisco has been called upon to give particular attention to the problem of lessening the injury to fruits by frost. By direction of the Chief of the Weather Bureau, during the year 1900 the forecast official for the southern half of the Pacific slope made an extensive journey through California with the special purpose of studying the methods of protecting deciduous fruits from frost. This journey was the natural outgrowth of the excellent work inaugurated by Mr. W. H. Hammon, formerly professor in the Weather Bureau, while in charge of the San Francisco office. During the years 1897, 1898, and 1899 the unusually dry winter conditions, with frequent and prolonged frosts and lower temperatures than had been previously reported in many of the chief fruit-growing centers of southern California, made it imperative that some steps should be taken to minimize the injury to citrus fruits by frost. The problem as presented to the forecast official was of a twofold nature. First, a study of the conditions preceding frost, so that he might with reasonable certainty give timely warning to the fruit growers; second, a study of the methods, means, and devices for protecting fruit from injury by low temperatures. The first has been solved with a fair measure of success. In the second problem the Weather Bureau had the valuable assistance of certain practical fruit growers, who willingly and readily tested the various devices proposed for smudging and cheerfully gave this office the benefit of the many practical experiments made by them in smudging, irrigating, heating, and covering. A bulletin on frost fighting, by Alexander G. McAdie (Bulletin No. 29), was issued on March 13, 1900, and nearly 3,000 copies distributed to those most interested in fruit growing. A previous bulletin (No. 23) upon frost, when to expect it and how to lessen the injury therefrom, by Prof. W. H. Hammon, had been issued on November 10, 1898, while a Farmers' Bulletin, No. 104, by Prof. E. B. Garriott, Notes on Frost, was issued June 15, 1899, which treated of frost protection in general.

It has become evident in California that the fruit grower must possess a degree of intelligence certainly as high as is demanded in any one of the usual vocations of life. The successful



orchardist must be a skilled farmer and a good business man and, at the same time, be familiar with the chief principles of modern science. He must be chemist, entomologist, and physicist, as well as fruit grower. In the matter of protecting his crops from frost, for example, he must know exactly what method is best suited for his crop, for the locality, and for the season, and be prepared to act promptly, or else the greater portion of the year's profits will vanish in the course of a few hours.

In what follows extensive use will be made of Bulletin No. 29, since experience has shown that the principles of frost fighting laid down therein are essentially correct. While this bulletin was written chiefly with a view of protecting the citrus fruit crops of California, particularly of the section south of the Tehachapi, from frost, the principles hold, as a general rule, for the protection of deciduous fruits also.

In October and November, 1900, an attempt was made to extend the benefits of the Weather Bureau work in connection with frost to the fruit growers of central and northern California, particularly to the growers of almonds, apricots, peaches, prunes, pears, apples, grapes, and figs. Many fruit ranches were visited, and the details of losses by frost gathered from ranch superintendents and others, together with all data available relative to the exposure of the fruit, the lay of the land, and the lowest temperatures. The following facts stand out prominently from the general mass of statements. First, that in California the greatest injury is done deciduous fruits by the late spring frosts occurring as late as the 23d of May, when fruit is well formed, frequently resulting in the loss of three-fourths of the crop in the case of the more tender fruits, as for example, almonds and apricots. Second, in all the fruit ranches visited rough maps of the localities showed conclusively that the frost occurred chiefly in the low places, basins, and bottoms, or where the cold air had drained down and settled. The principle laid down in Bulletin No. 29, that frost was primarily a problem in air drainage, was conclusively upheld. Wherever the air was stagnant the injury from frost was most marked; and, conversely, wherever the air was in motion there was little damage from frost. Fruit on open benches, hillsides, and terraces escaped. The streakiness of frost and the many apparent irregularities in its formation can be explained easily if we remember that there are currents and stream lines in the air, and that these currents may have rather sharply defined limits. A slow-moving current of air on a still night in an orchard that appears to be nearly level may result in an absence of frost along its path, while close by, where the air is stagnant, frost will be formed.

A third particular point resulting from this visit to the ranches was the confirmation of the belief that the damage from frost could be greatly lessened if some means were provided whereby the chilled fruit could be protected from the sudden warming at sunrise. Some rough temperature observations made in ranches at about the time of sunrise on frosty mornings showed a rise of as much as  $10^{\circ}$  in the air temperature within thirty minutes. It was also noted in several ranches that the areas of greatest loss by frost were those where the sun's heat came suddenly upon the trees. It is believed that much fruit can be saved even when chilled or frozen if some screen is interposed between the fruit and the sun, so that the warming may be gradual. It is even admissible to thoroughly wet the fruit with cold water, and there are numerous instances of fruit escaping serious injury even when it has been covered with a thin coating of ice. It is of the utmost importance that the thaw for an hour or two following sunrise be gradual.

The following methods of protecting fruit from frost are taken from Bulletin No. 29:

#### METHODS OF PROTECTING.

Every fruit grower should put himself in communication with the nearest center of distribution of weather forecasts. If possible he should be in daily communication with some Weather Bureau office. Whenever frost warnings are issued for his locality he should carefully determine the temperature and dew-point, as elsewhere described, frequently during the late afternoon and night. A good outfit consists of a metallic thermometer so arranged as to automatically close an electric circuit and ring an alarm whenever the temperature of the air reaches  $32^{\circ}$ . In addition to a reliable sling psychrometer there should be some small device for testing the motion of the gentle air currents in the orchard. Too much attention can not be given to this question of air motion. Many smudging devices have failed to be effective because of a slow movement of the smoke away from the orchard.

## PROTECTIVE METHODS BASED ON MIXING THE AIR

It is well known that lowlands are visited with frost while hillsides and hilltops escape. Every fruit grower should study the topography of his land and plant accordingly. Wind-breaks are, as a rule, considered detrimental. No hard and fast rule, however, can be laid down. On a well-known lemon and orange ranch at Santa Paula, the

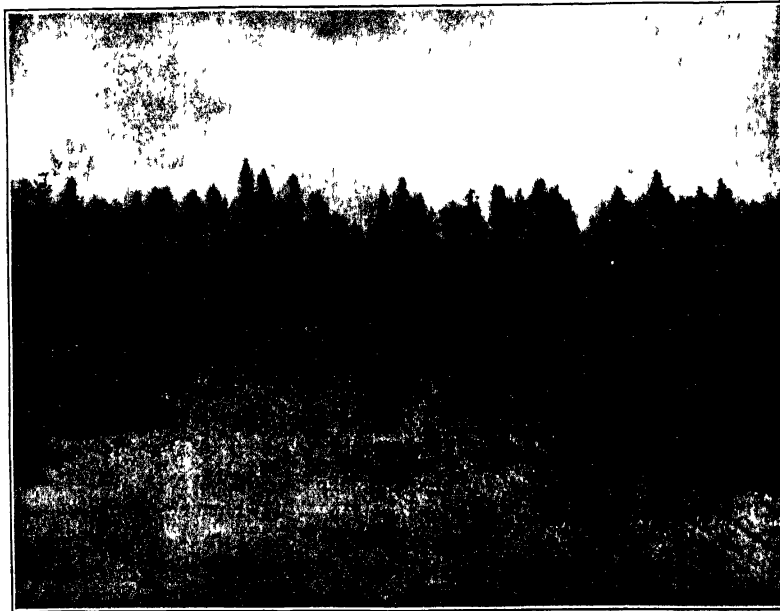


FIG. 13.—Wire baskets in citrus grove

property of Mr. N. W. Blanchard, there are several large wind-breaks which have proven themselves to be of the greatest benefit in protecting fruit from frost. It would almost seem as if the citrus trees within a distance of 50 feet were directly protected by these wind-breaks. By planting a wind-break in the proper place, defects in the

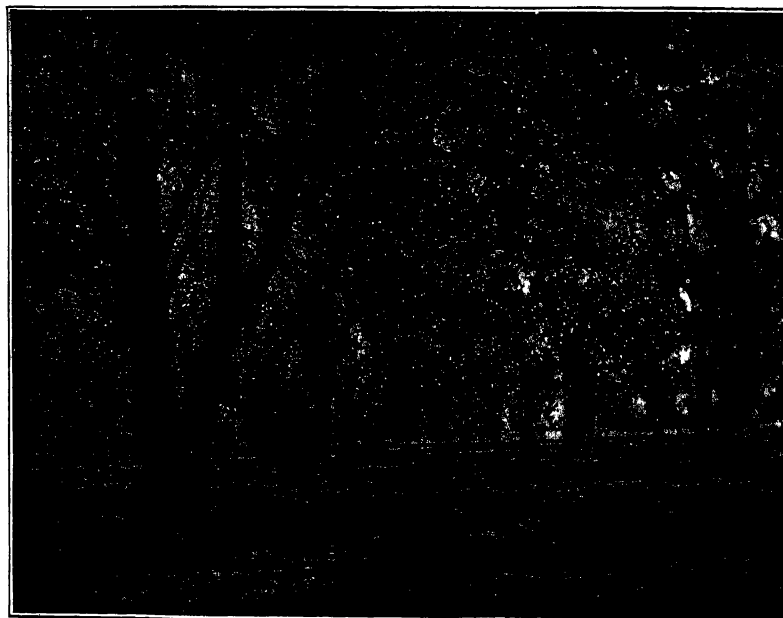


FIG. 14 —Wire baskets hung from limbs of orange trees

topography may be overcome and air currents established where otherwise pools of quiet air would have formed. A wind-break dense enough and so situated as to interfere with any natural circulation and facilitating the formation of still areas or pools would, of course, prove injurious.

## PROTECTIVE METHODS BASED ON WARMING THE AIR.

A large number of small fires, advantageously placed, will raise the temperature of the air several degrees. The Riverside Horticultural Club, testing the various methods which were in use in California, came to the conclusion that wire baskets suspended a few feet above the ground, and holding several pounds of coal or charcoal, made an efficient protector. This method was described by Mr. Edward Copely, of Riverside, Cal., in several articles published in the Riverside Press of April, 1896. The cost of the wire basket is about 10 cents, and if 40 baskets be used to the acre, the cost of fuel will hardly exceed \$2.50. To this must be added the cost of labor during the night and succeeding day in refilling the baskets. In the accompanying figs. 13, 14, and 15, the baskets are shown in position. This method meets with most favor in southern California. The temperature can be raised certainly 3° or 4° with from 20 to 40 of these baskets to the acre. It has been suggested that a number of small oil lamps be used with success for this purpose. Oil pots have been used and make a hotter fire, but the deposit of lamp black upon the fruit is objectionable. Some cheap modification of the ordinary plumber's furnace might possibly be devised, which, by means of a moderate blast, would produce a high temperature.

## PROTECTIVE METHODS BASED ON CLOUD OR FOG FORMATION.

Damp straw, old wood, prunings, manure, etc., when burned briskly furnish an effective smoke, and if the material while burning is doused with water the result is a dense steamy smoke, which, while trying to human lungs, serves as a screen to prevent loss of heat by radiation, and as a barrier between the chilled fruit and a sudden

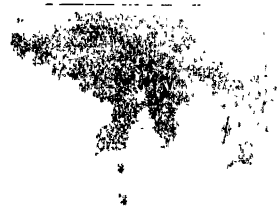


FIG. 15.—Wire baskets in lemon and orange grove.

application of heat at the time of sunrise. Wet smudging has been tried in many ways with varying results. There are many reports of failure and, on the other hand, some definite results, showing the good accomplished by this method. Here, as in all other methods of protection, much will depend upon a careful study of the local conditions. Many a farmer smudges so that some neighbor gets the benefit of his work, while his own fruit remains unprotected. All motion of the air should be noted carefully, and this is sometimes difficult where the smoke is very dense. In some orchards sacks of old straw soaked with oil are so distributed as to be available for quick lighting. Portable smudges have also been devised. Fig. 16 illustrates a portable device by Mr. Priestley Hall.

Mr. Hall has made an efficient form of sled operating on the wet-smudge principle. Upon a sheet-iron sled he has placed a small fire box, consisting of a grate 4 or 5 inches above the bed of the sled, over which pass iron rods bent in the form of an arch, leaving a space for the fire about 14 inches in diameter. This fire box is inclosed in a large corrugated iron box, which has the bed of the sled (about 3 or 4 feet in size) for a bottom, and sides 30 inches high. A door is made in front of the corrugated box to admit fuel to the fire. The box is filled with wet straw or manure, and a fire is maintained in the fire box when the machine is in operation. The cost is about \$12; one will do for 10 acres.

## PROTECTIVE METHODS BASED ON IRRIGATION.

Of all methods proposed for the protection of fruit, excepting wire baskets, irrigation has the largest amount of evidence in its favor. It has been tried in many different places with different crops and has generally given satisfaction. Where water is not very plentiful, and this is the case strangely enough in some fruit sections, the method

may not always be practicable, but with this exception there are many decided advantages in the generous use of water. Injury from frost depends almost as much upon the condition of the tree as upon the severity of the weather. Critical periods in the life of the tree can be controlled to some degree by the use of water.

Some fruit growers hold that heat is the one thing that is desired at times of frost, and that the best method is that which produces heat by the simplest and least expensive process. Water, owing to its high specific heat, forms



FIG. 16.—Mr Priestley Hall's device for smudging.

an excellent agency for the temporary storage of heat energy. We have seen that in the wet smudge an attempt is made to utilize the latent heat of vaporization, and theoretically this has always seemed the most advantageous method. A modification of the wet smudge is steam piped through an orchard. This experiment was made by the Wright Brothers at Riverside, Cal, with a 35-horsepower boiler and a main pipe 2 inches in diameter, from which,



FIG. 17.—Eight miner's inches of warm water in orange grove at Meacham Ranch

at right angles every 40 feet, pipes three-quarters of an inch in diameter were extended. It is claimed that the temperature was raised 3° whenever the steam was turned on. It is also said that the coal consumed would not be more than the amount used by the basket method. The estimated expense per acre would be about \$75.

The latest device for the protection of citrus fruit against frost combines the good effects of irrigation with heating. This is a method known as the warm-water method, tried at Riverside. An account of the experiment follows.

EXPERIMENT OF MR. ERNEST A. MEACHAM, RIVERSIDE, CAL.

"On the morning of February 9, 1900, at the Meacham Ranch, a test was made of the Meacham warm-water method of protecting citrus fruits against frost. The experiment began at 3.45 a. m. and was conducted in the presence of a number of gentlemen belonging to the Riverside Horticultural Club, nearly all of whom were orange growers.

"At 6.30 a. m. the temperature of the ground 100 feet or more away from the boiler was 32°. The temperatures given herewith are those obtained by Mr. McAdie, of the Weather Bureau, with sling psychrometer No. 70; the number of the dry thermometer was 4487 and of the wet 4486. The plant consists of a 12-horsepower tubular horizontal boiler, laid in a brick furnace and arranged to deliver water with or without pressure. Cold water enters the bottom of the boiler and is delivered from the top orifice directly into the flume. The fuel used was crude petroleum, of which about 50 gallons were used in three and one-half hours. At the rate of 14 gallons an hour and an estimated cost of a little over 4 cents per gallon, the actual expense of fuel for the experiment was about 60 cents per hour. The oil is burned with a steam jet under pressure. A secondary 6-horsepower boiler, carrying 70 pounds of steam, was used. The oil is thus entirely consumed and makes but little smoke. The whole arrangement is such that not more than two men would be required to attend to all the details.

"Fifty minutes from the time of beginning, the water which had an initial temperature of 55.4° was raised 30°. Two sets of temperature records were made, one by Mr. Priestley Hall and the other by Mr. McAdie. In Mr. Hall's test 8 inches of water was run in 50 furrows, which barely ran the water past the ends of the furrows. In the second case 8 miners' inches of water was delivered into 25 furrows, thus carrying the heat farther down the furrows than

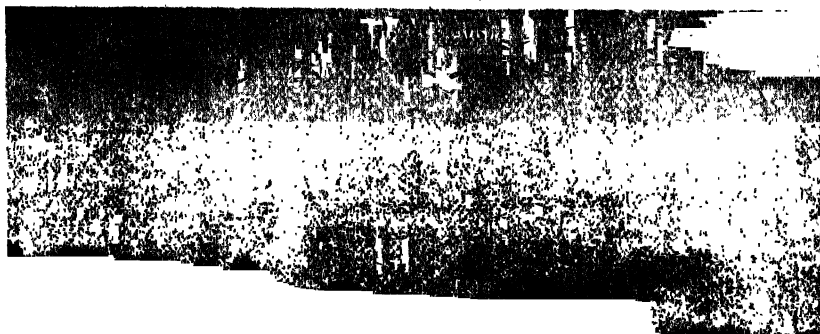


FIG. 18.—Lath screen at ranch of Mr. A. J. Everest, Riverside, Cal. (view from above).

in the first experiment. According to the present laws of California, a miner's inch is  $\frac{1}{7}$  cubic foot per second; the 'second-foot' is the quantity represented by a stream 1 foot wide and 1 foot deep, flowing at the average rate of 1 foot per second. A cubic foot of water, maximum density, weighs 62.4 pounds; a gallon contains 10 pounds of distilled water at 62°. The data obtained by Mr. Hall were as follows: 5.30 a. m., normal temperature, 34°; normal temperature of water, 60°; temperature of heated water, 92°; at the flume, 92°; 20 rods from the flume, 58°; 40 rods, 52°; temperature of unheated water 40 rods from the flume, 41.5°; vapor condensed on trees early in the morning and more condensed on the trees in the heated plat.

"Mr. McAdie's records are as follows: Time, 6.30 a. m., air temperature varying from 34° to 36°; temperature on the ground, 32°; frost was observed on grass blades; initial temperature of water, 55.4°; heated water delivered to flume at 85.2°; in a straight line down a furrow 200 feet from the boiler in the direction of the wind (motion of the air was very gentle) there was a fall in temperature of 14.2°; water vapor was observed rising to a height of about 4 feet; 200 feet from flume, as stated, the temperature of the water was 71°; the temperature of the surface soil 4 inches right and left of the water was 43°; temperature of the soil 16 inches from the water or in the middle of the ridge, 42.2°. It is presumed that the temperature of the ground, had no water been flowing, would have been 33°, and it would seem as if the soil itself was warmer by nearly 10°. At the end of a furrow, 600 feet, the temperature of the water was 54°, or there had been a fall of 31° in 40 rods; the temperature of the ground 4 inches from the water, 38°; 16 inches from the water, 36°; temperature of unheated water 50 rods from the flume, 40°.

"The approximate value of the plant was \$200, and it is estimated that for a plant all equipped sufficient for a 10-acre grove \$600 would cover all expenses." (See fig. 17.)

## SPRAYING.

After frost, or rather just before a frost has ended, a spraying device can be used to advantage. Its chief function is to prevent a too rapid warming of the chilled fruit. It is said by horticulturists that even the light coating of ice formed in this way does not seriously damage the fruit. It is very likely that the latent heat of solidification set free by the change from water to ice may play a helpful part; but the chief effect is to prevent a too rapid thawing. In other words, both heat and water should be supplied to the chilled plant slowly and according to the plant's ability to make good use of the same. At the A. J. Everest Ranch at Riverside, Cal., a portion of the grove is protected by sprinklers at the top of 50-foot masts.

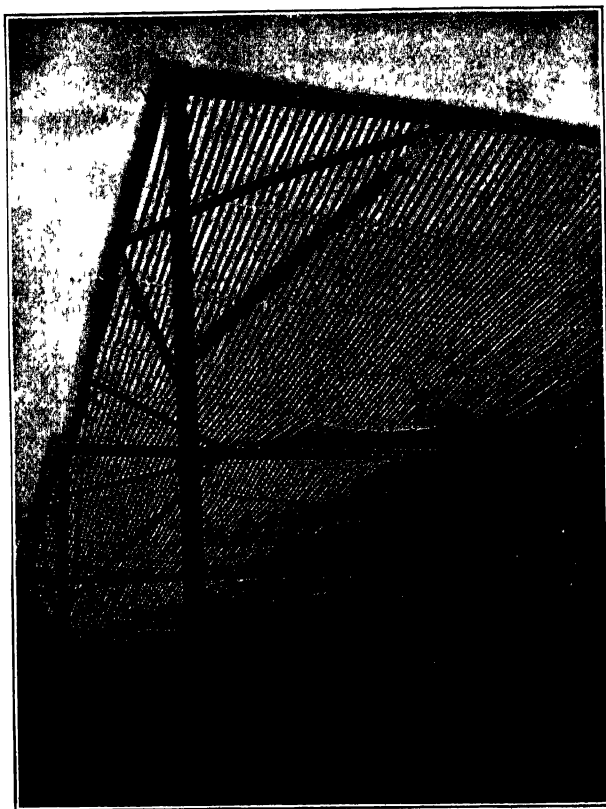


FIG. 19.—Lath screen at ranch of Mr. A. J. Everest, Riverside, Cal. (under view)

## PROTECTIVE METHODS BASED UPON SCREENING OR COVERING

All screening or covering devices are in effect modified hothouses, and there is no question but that a thorough protection can be accomplished. The expense is the one objection. Screens are made of light materials, namely, canvas, muslin, or light wood work, and have been used with considerable success. At the A. J. Everest Ranch an elaborate structure of lath screens is in use, illustrations of which are given herewith (see figs. 18 and 19). There is no question as to the value of the protection, but the expense is considerable, averaging perhaps \$400 to the acre. This lath covering may be considered as forming a well-ventilated hothouse.

## KILLING FROSTS.

The following table gives the dates on which occurred killing frosts during the year 1899—the last in spring and first in autumn—at stations recording and reporting frosts. The blank spaces in the table indicate that there were no killing frosts at those stations for the period shown, or, in some few cases, that the record is incomplete.

1899.

Killing frost.			Killing frost.			Killing frost.		
Station.	Last in spring.	First in autumn.	Station.	Last in spring.	First in autumn.	Station.	Last in spring.	First in autumn.
Acton .....	Mar. 10		Florence .....	Mar. 12	Dec. 10	Oroville .....	Feb. 4	Dec. 19
Agnew .....		Dec. 2	Folsom .....	Feb. 8	Dec. 18	Palermo .....	Mar. 10	Do.
Alhambra .....	Feb. 7		Fort Bragg .....	Mar. 18	Oct. 15	Palo Alto .....	Feb. 8	Do.
Alvarado .....	May 2	Nov. 28	Fort Ross .....	Mar. 21	Dec. 18	Paso Robles .....	Apr. 23	Dec. 20
Alviso .....	Mar. 18	Do.	Fresno .....	Feb. 7		Peachland .....	Mar. 10	Dec. 18
Anada .....	May 15	Oct. 6	Fruto .....	Mar. 9	Nov. 23	Placerville .....	Apr. 28	
Anaheim .....	Apr. 17	Dec. 12	Georgetown .....	May 1	Oct. 15	Pomona (near) .....	Mar. 14	Dec. 9
Anderson .....	Apr. 30	Dec. 3	Gilroy .....	Mar. 11	Dec. 6	Porterville .....	Mar. 10	Dec. 10
Angiola .....	Feb. 10		Grand Island .....	Feb. 7		Poway .....	Feb. 7	Do.
Aptos .....	Mar. 10	Oct. 31	Greenville .....	Apr. 29	Oct. 1	Puente .....		Do.
Auburn .....	May 2	Oct. 15	Guadalupe .....	Mar. 18	Oct. 15	Quincy .....	May 20	Aug. 22
Banning .....	Feb. 6		Guinda .....	May 1	Dec. 9	Raymond .....	May 22	Dec. 1
Bayles .....	May 1	Dec. 9	Hanford .....	Apr. 29		Red Bluff .....		Dec. 19
Ben Lomond .....	Mar. 10	Dec. 6	Hayward .....	Mar. 13	Dec. 9	Redding .....	May 1	Dec. 14
Berkoley .....	Jan. 5	Dec. 18	Healdsburg .....	Apr. 17	Oct. 13	Redlands .....	Feb. 5	
Biggs .....	Mar. 10		Hollister .....	Feb. 5	Dec. 6	Reedley .....	Apr. 28	
Boca .....	May 1	Oct. 2	Independence .....	Mar. 18	Oct. 12	Repressa .....	Feb. 9	
Boulder Creek .....		Oct. 24	Iowa Hill .....	Mar. 17	Dec. 9	Riverside .....	Mar. 3	
Bowman's Dam .....	May 1	Nov. 16	Jackson .....	Apr. 28	Oct. 15	Rocklin .....	Mar. 13	
Buena Park .....	Mar. 4	Oct. 28	Jolon .....	Apr. 23	Dec. 1	Romie .....	May 16	Dec. 6
Burlingame .....		Dec. 18	Keene .....	Mar. 19	Oct. 15	Rosewood .....	Mar. 12	Do.
Byron .....	Feb. 12	Dec. 2	Kernville .....	May 11	Oct. 7	Sacramento .....	Feb. 5	Dec. 18
Cahito .....	May 9	Oct. 25	Kingsburg .....	Apr. 28		Salinas .....		Dec. 6
Callistoga .....	May 1	Oct. 1	La Grange .....	Feb. 5	Dec. 9	San Ardo .....		Dec. 9
Campbell .....	Mar. 10	Dec. 18	La Porte .....	Apr. 23	Sept. 6	San Francisco .....	Feb. 5	
Capitola .....	do	Nov. 8	Laurel .....	Mar. 12	Oct. 24	Sanger .....	Jan. 26	
Castroville .....		Dec. 20	Lawrence .....	Mar. 18	Nov. 22	San Leandro .....	Mar. 10	
Cedarville .....	May 18	Oct. 2	Lemon .....	Feb. 22		San Luis Obispo .....	Feb. 4	Dec. 27
Chico .....	Mar. 30	Dec. 12	Lemoore .....	Mar. 11		San Mateo .....	Feb. 7	
Claremont .....	Feb. 6		Lick Observatory .....	May 25	Oct. 15	San Miguel .....	Feb. 9	Dec. 18
Colfax .....	May 1	Dec. 5	Lincoln .....	Mar. 7		Santa Clara .....	Mar. 17	Dec. 7
Colton .....	Feb. 7		Lodi .....	Mar. 10	Dec. 9	Santa Cruz .....	Apr. 6	
Corning .....	Feb. 6		Los Gatos .....	Mar. 8	Do.	Santa Margarita .....	Apr. 3	Nov. 27
Coyote .....	May 10	Oct. 9	Madera .....		Dec. 10	Santa Paula .....	Feb. 7	
Craftonville .....	Feb. 6		Manzana .....	Feb. 7		Santa Rosa .....	Mar. 17	Dec. 19
Crescent City .....	June 19	Oct. 14	Menlo Park .....	Feb. 6	Dec. 18	Sargent .....		Dec. 20
Cuyamaca .....	Mar. 23	Dec. 9	Merced .....	Mar. 11	Dec. 10	Selma .....	Feb. 7	
Danville .....	May 20	Dec. 1	Milbrae .....	Feb. 7	Dec. 17	Shasta .....	Mar. 13	Dec. 14
Davisville .....	Feb. 7	Dec. 19	Mills College .....		Dec. 1	Soledad .....	Feb. 6	
Dinuba .....	May 2	Nov. 27	Milo .....	Apr. 10	Dec. 20	Suisun .....	Feb. 8	
Duarte .....	Feb. 7		Mokelumne Hill .....	Apr. 28	Nov. 30	Summerdale .....	May 2	Oct. 24
Dunnigan .....	do	Dec. 19	Monterey .....		Dec. 20	Susanville .....	May 25	Oct. 2
Durham .....	Mar. 13	Dec. 9	Moreno Dam .....	May 16		Thermalito .....	Apr. 30	Dec. 19
Edgewood .....	Apr. 29	Oct. 15	Mount Eden .....	Mar. 10	Dec. 10	Traver .....	Feb. 5	
Edmanton .....	May 2	Oct. 11	Mount Tamalpais .....	Feb. 6	Dec. 17	Tulare (near) .....	Mar. 12	Dec. 10
El Cajon .....	Feb. 7	Dec. 10	Napa .....	Mar. 13	Dec. 19	Ukiah .....	Feb. 5	Dec. 13
El Casco .....	Apr. 26	Dec. 6	Needles .....	Feb. 5		Upper Mattole .....	do	Dec. 9
El Dorado .....	do	Dec. 20	Nevada City .....	May 1	Oct. 15	Vacaville .....	Feb. 9	Dec. 19
Elk Grove .....	Mar. 10		New Almaden .....	Mar. 10	Dec. 18	Valley Springs .....	Apr. 28	Dec. 18
Elmira .....		Oct. 26	Niles .....	Apr. 29		Watsonville .....		Dec. 19
Elsinore .....	Mar. 12	Dec. 10	North Bloomfield .....	May 2	Oct. 24	West Point .....	May 29	Oct. 12
Escondido .....	Mar. 18	Dec. 7	North Hill Vineyard .....	Mar. 13	Dec. 9	West Saticoy .....	Feb. 8	
Eureka .....	Feb. 7	Dec. 18	North Ontario .....	Mar. 18		Wheatland .....	Apr. 1	
Exeter .....	Feb. 6		North San Juan .....	May 2	Oct. 30	Willows .....	Apr. 26	Dec. 13
Fall Brook .....	Feb. 8		Oakland .....	Feb. 5		Woodland .....	Apr. 2	Dec. 4
Farmington .....	Mar. 13	Dec. 6	Oleta .....	Apr. 20	Oct. 15	Yreka .....	May 20	Sept. 6

NOTE.—Killing frosts occurred in every month of the year at Bodie, Mono County. The observer at Los Angeles reports that there were no killing frosts at that station during the year; the first heavy frost occurred December 11, damaging vegetables in exposed places. At San Diego the most severe frost for five years occurred February 6, but did not damage orchards or fruit in citrus region.

1900.

Stations	Eleva- tion	Last in spring	First in autumn	Stations	Eleva- tion	Last in spring	First in autumn
	<i>Feet</i>				<i>Feet</i>		
Anaheim ..	134	Mar 13	Dec 29	North Hill Vineyard ..	660	Feb 7	Dec 30
Angiola ..	208	Feb 10	Dec 27	North Ontario ..	1,800		Dec 29
Arroyo Grande ..		Feb 8	Dec 31	North San Juan ..	2,130	Mar 20	Oct 29
Bear Valley ..	4,600	May 15	Oct 12	Oakland ..	14		Dec 30
Bellevue ..		Apr 23	Sept 26	Oleta ..	1,510	Apr 8	Dec 1
Berkeley ..	320	Feb 19	Dec 30	Oroville ..	188	Jan 24	Dec 30
Bodie ..	8,248	June 2	Aug 7	Palermo ..	185		Dec 23
Bowman's Dam ..	5,600	May 25	Sept 20	Paso Robles ..	723	Apr 26	Oct 30
Campbell ..	194	Apr 8	Dec 28	Peachland ..	220		Dec 28
Campo ..		Apr 10	Sept 26	Pilot Creek ..	4,000	June 21	Sept 20
Cedarville ..	4,675	Apr 27	Sept 18	Placerville ..	1,820	Feb 7	Nov 28
Chico ..	193	Apr. 10	Dec 28	Pollasky ..	1,200	do	Dec 28
Cottonwood ..	423	Mar 28	Nov 27	Pomona (near) ..	857	Feb 12	Dec 17
Craftonville ..	1,759	Feb 4	Dec 29	Porterville ..	461	Feb 11	Dec 28
Crescent City ..	50	Apr 26	Nov 20	Quincy ..	3,350	May 28	Sept 6
Cuddeback ..		Apr 6	Dec 4	Redbluff ..	307		Dec 29
Cuyamaca ..	4,543	Apr 30	Sept 26	Redding ..	557	Feb 9	Dec 3
Delta ..	1,138	Feb 9	Sept 6	Redlands ..	1,335	Apr 9	Dec 31
Drytown ..	790	Feb 6	Dec 28	Rosewood ..	865	Apr 10	Dec 23
Durham ..	180	Mar 28	Dec 23	Sacramento ..	35		Dec 31
Edmanton ..	4,750	Apr 24	Oct 29	San Ardo ..	236	Apr 10	Dec 22
Eldorado ..	1,609	Apr 9		San Bernardino ..	1,054		Dec 31
Elmdale ..	126	Jan 9	Dec 27	San Francisco ..	183		Dec 30
Elmira ..	75	Feb 8	Nov 30	San Jacinto ..	1,500	Apr 12	Oct 28
Elsinore ..	1,271	Apr 8	Dec 29	San Leandro ..	84		Dec 30
Farmington ..	111	Apr 4	Oct 29	San Luis Obispo ..	201	Apr 8	Dec 29
Folsom ..	182		Dec 30	San Miguel ..	616	Feb 10	
Fort Tejon ..	7,650	Apr 10	Oct 24	Santa Ana ..	137		Dec 23
Fresno ..	293		Dec 31	anta Clara ..	88	Apr 9	Dec 31
Garberville ..		May 1	Dec. 25	Santa Cruz ..	18	Mar 27	Dec 23
Georgetown ..	2,750	Apr 8	Nov. 19	Santa Maria ..	220	Apr 10	Dec 13
Gilroy ..	193	Apr 9	Dec. 23	Santa Paula ..	286		Dec 30
Grand Island ..	65	Jan 25	Dec 30	Santa Rosa ..	181	Apr 9	Oct 29
Greenville ..	3,600	May 28	Oct 1	Shasta ..	1,148		Nov 21
Hanford ..	249	Feb 26	Oct 25	Sonoma ..	30	Apr 9	Dec 30
Healdsburg ..	100		Oct 29	Stanford University ..	70	Apr 10	Dec 31
Hollister ..	284	Apr 10	Dec 4	Stockton ..	33		Do
Independence ..	3,907	Mar 7	Oct 30	Sunsun City ..	20	Feb 12	Dec 23
Ione ..	287	Feb 8	Dec 28	Summerdale ..	5,270	May 28	Sept 25
Iowa Hill ..	2,825	Mar 5	Dec 31	Susanville ..	4,195	Apr. 27	Sept 24
Jackson (near) ..	1,975	Apr 8	Oct 29	Tequisquita Rancho ..		Apr 10	Dec 23
Jolon ..		do	Oct 23	Thebe ..		Mar 15	Oct 1
Kernville ..	2,600	May 9	Sept 27	Thermalito ..	236		Dec 30
Kono Tayee ..	1,325		Dec 28	Tulare ..	274	Mar. 28	Oct 30
Laporte ..	5,000	May 28	Sept 6	Ukiah ..	620	Apr 9	Dec 28
Le Grand ..	255	Apr 4	Dec 27	Vacaville ..	175	Feb 7	Dec 29
Lick Observatory ..	4,209		Oct 2	Valley Springs ..	673	Mar 27	Do
Lodi ..	35	Apr 9	Dec 29	Vina ..	213	Apr 2	
Manton ..		Apr 26	Nov 15	Visalia ..	334	Apr 10	Dec 28
Merced ..	173	Mar 28	Dec 30	Watsonville ..	23	Apr 8	
Mokelumne Hill ..	1,550	Apr 8	Dec 2	West Point ..	2,826	Apr 9	Oct 7
Moreno Dam ..	3,100	Apr 29	Oct 30	Wheatland ..	84	do	Dec 28
Napa ..	20	Feb 6	Dec 30	Wire Bridge ..	565	do	Dec 23
Nevada City ..	2,580	Apr 27		Woodland ..	63	Mar 5	Nov 29
Niles (near) ..	87	Apr 9	Dec 30	Yreka ..	2,635	Mar 29	Sept 30
North Bloomfield ..	3,000	Apr 14	Oct 29	Yuba City ..	70	Jan 24	Dec. 29



## AVERAGE DATES OF KILLING FROSTS.

Stations.	Counties.	Elevation.	Average date.		Stations.	Counties.	Elevation.	Average date.	
			Last in spring.	First in autumn.				Last in spring.	First in autumn.
		<i>Feet.</i>					<i>Feet.</i>		
Anaheim .....	Orange .....	134	Apr. 4	Dec. 20	North Ontario .....	San Bernardino ..	1,800	Mar. 14	Dec. 14
Berkeley .....	Alameda .....	320	Jan. 28	Dec. 15	North San Juan .....	Nevada .....	2,130	Apr. 11	Oct. 15
Bowman's Dam .....	Nevada .....	5,600	Apr. 26	Oct. 25	Oakland .....	Alameda .....	14	Jan. 7	Dec. 20
Campbell .....	Santa Clara .....	194	Mar. 25	Nov. 25	Oleta .....	Amador .....	1,510	Mar. 20	Nov. 19
Cedarville .....	Modoc .....	4,075	May 15	Oct. 6	Paso Robles (near) ..	San Luis Obispo ..	723	Apr. 1	Nov. 5
Claremont .....	Los Angeles .....	1,200	Mar. 17	Dec. 5	Poachland .....	Sonoma .....	220	Apr. 14	Nov. 21
Crescent City .....	Del Norte .....	50	May 10	Nov. 7	Pomona (near) .....	Los Angeles .....	857	Apr. 2	Nov. 20
Durham .....	Butte .....	180	Apr. 5	Do.	Quincy .....	Plumas .....	3,350	May 15	Sept. 14
Edmonton .....	Plumas .....	4,750	May 10	Oct. 22	Redbluff .....	Tehama .....	307	Mar. 27	Dec. 16
Elsinore .....	Riverside .....	1,271	Mar. 23	Nov. 26	Riverside .....	Riverside .....	1,000	Mar. 17	Dec. 20
Eureka .....	Humboldt .....	64	Mar. 29	Nov. 29	Rosewood .....	Tehama .....	865	Apr. 8	Nov. 7
Fresno .....	Fresno .....	293	Mar. 1	Nov. 15	Sacramento .....	Sacramento .....	35	Feb. 16	Nov. 15
Healdsburg .....	Sonoma .....	100	Apr. 8	Nov. 16	San Francisco .....	San Francisco .....	183	Jan. 25	Dec. 10
Hollister .....	San Benito .....	284	....do....	Nov. 21	San Luis Obispo .....	San Luis Obispo ..	201	Mar. 5	Nov. 18
Independence .....	Inyo .....	3,507	Mar. 23	Oct. 25	Santa Maria .....	Santa Barbara .....	220	Mar. 10	Nov. 25
Iowa Hill .....	Placer .....	2,825	Mar. 15	Dec. 16	Summerdale .....	Mariposa .....	5,270	May 7	Oct. 17
Jackson (near) .....	Amador .....	1,975	Apr. 15	Oct. 25	Susanville .....	Lassen .....	4,195	May 10	Sept. 22
Lodi .....	San Joaquin .....	35	Mar. 12	Nov. 16	Ukiah .....	Mendocino .....	820	Apr. 14	Nov. 1
Mokelumne Hill .....	Calaveras .....	1,550	Mar. 21	Dec. 15	Vacaville .....	Solano .....	175	Mar. 12	Dec. 21
Napa (S. H.) .....	Napa .....	20	Mar. 20	Nov. 15	Wheatland .....	Yuba .....	84	Feb. 20	Nov. 26
North Bloomfield .....	Nevada .....	3,000	Apr. 17	Do.	Yreka .....	Siskiyou .....	2,635	May 24	Sept. 26
North Hill Vineyard ..	Calaveras .....	660	Feb. 20	Dec. 13					

## FOG.

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One of the most marked atmospheric conditions with which the forecaster has to deal on the coast of California is fog. Particularly in the vicinity of San Francisco are the effects of the fog noticeable. Owing to the peculiar topography of this section, there are certain well-marked stream lines in the general movement of the air from west to east; and in these streams great masses of the condensed-water vapor lying beyond the heads and along the coast are carried in through the Golden Gate. There are times when, judging from such reports as are available, fog prevails along the entire Pacific coast. On the daily weather map which is issued at San Francisco attention has been called several times within the last few years to the fact that nearly every coast station reported fog, thus indicating the presence of a bank of fog at sea from 1,400 to 1,600 miles in length. The distance seaward to which this fog extended is not known, but from the records contained in logs of vessels sailing from San Francisco it is thought that an average value would be about 50 miles. Now, fog, whether it appears for a few hours at certain seasons, as in the harbors of the Atlantic coast, or regularly on summer afternoons and winter mornings along the Pacific coast, and whether it lies in sharply defined streams and strata, as at San Francisco, or in ill-defined general banks, as off Newfoundland, indicates certain sharp contrasts of temperature and air motion. On the Pacific coast there are several well-marked types of fog—the summer afternoon fog, moving from the sea to the land; the morning winter land or tule fogs, which move seaward, and occasional nondescript smoke fogs near the larger cities.

At Mount Tamalpais we are able to look down upon the fog streaming through the Golden Gate. On one side the ocean maintains a temperature of about  $55^{\circ}$  F., while inland the temperature is much higher. Some illustrations of the fog effects as photographed at the Weather Bureau Observatory were published in the Monthly Weather Review for July and November, 1900, and January, February, and March, 1901, and are here reproduced.

The differences in temperature, humidity, and air motion are so marked within comparatively small distances, both horizontally and vertically, in the bay district that it seemed advisable to tabulate in comparative form the meteorological elements for a year at the higher station (elevation approximately half a mile) and the station at sea level. The present paper aims to present, with some photographic evidence of fog forms and drifts, a rough study of the air drainage of the locality in which fog streams and counter streams are of such frequent occurrence that they serve excellently as exponents of air motion. The topography of the section is remarkable, because of the close juxtaposition of ocean, bay, mountain, and foothill. A valley, level as a table, 450 miles long and 50 miles wide, having afternoon temperatures of  $100^{\circ}$  or over, is connected by a narrow water passage with the Pacific Ocean, the mean temperature of the water in this locality being  $55^{\circ}$ . Thus within a distance of 50 miles in a horizontal direction there is frequently a difference of  $45^{\circ}$  in temperature, while in a vertical direction there is often a difference of  $30^{\circ}$  in an elevation of half a mile. High bluffs, ridges, and headlands are at such an angle to the prevailing strong westerly surface air currents that an air stream is forced with increased velocity through the Golden Gate, and there must of necessity be considerable piling up of both air and water vapor at this point. The locality may indeed be considered as a natural laboratory in which experiments connected with cloudy condensation of water vapor are daily wrought, and it is therefore of more than passing interest to the meteorologist.

Much faithful work has been done in physical laboratories on the behavior of water vapor at varying volumes, pressures, and temperatures. Regnault, Thomson, Broch, Aitken, Kiessling, R. von Helmholtz, Hertz, Rayleigh, Von Bezold, Barus, Marvin, and others have worked upon the change of state from vapor to liquid and from liquid to solid; and while many irregularities are noted in the behavior of water vapor, the general problems of decreasing volumes and increasing pressures until condensation points are reached have been solved, and it is well understood that the vapor-liquid and liquid-solid condensations are in themselves but two phases in a chain of condensation phenomena. The problem of fog is therefore a limited one. It may be considered as a special case of cloud development, occurring in the first and second stages of Hertz, viz, the unsaturated and saturated stages. Condensation in the free air, as in these fog formations, takes place under conditions different from those obtaining in the laboratory. There are no fixed, restraining walls, though the strongly stratified outlines suggest sharply limited air streams. Again, saturation as it occurs in free, constantly changing air and true adiabatic saturation are not identical. Saturation in the free air must be studied under disadvantageous circumstances, for the work must be done at a distance, with instruments neither sufficiently delicate nor accurate, and there is no control of conditions possible. In passing it may be noted that, except for traces of salt, the air of the section under consideration is partially filtered, as it presumably comes from off the broad ocean and is as free from land dust and smoke as normal air can be. Offshore winds are infrequent and light.

An attempt has been made at the Mount Tamalpais station to correlate the surface pressure conditions with fog. A typical pressure distribution accompanying sea fogs has been recognized. In general, a movement southward along the coast of an area of high pressure in summer means fresh northerly winds and high temperature in the interior of the State, with brisk westerly winds, laden with fog, on the coast.

An excellent illustration of a successful forecast of fog may be found in connection with the daily weather map of June 30, 1899, and also July 1, 1899. It should, however, be stated that fog does not always occur with these typical fog maps. For example, on June 28, 1899, the pressure distribution was such as to lead to the expectation of fog, but no fog was reported on this date.

#### COMPARATIVE DATA FOR SAN FRANCISCO AND MOUNT TAMALPAIS.

In Bulletin No. 28 issued by the Weather Bureau, entitled "The Climate of San Francisco," meteorological data pertaining to the city of San Francisco are given up to the beginning of 1899. It is not necessary to repeat here these records; but the data for 1899, being available, possess special interest:

Mean monthly temperatures.			Mean monthly temperatures.			Mean monthly temperatures.		
Year and month.			Year and month.			Year and month.		
	Mount Tamalpais.	San Francisco.		Mount Tamalpais.	San Francisco.		Mount Tamalpais.	San Francisco.
1899.	°F.	°F.	1899.	°F.	°F.	1899.	°F.	°F.
January .....	47.8	53.0	June .....	66.8	58.9	November .....	49.4	50.8
February .....	47.6	51.6	July .....	71.0	55.9	December .....	47.7	49.0
March .....	44.6	52.2	August .....	61.4	58.3	Annual .....	55.6	54.9
April .....	51.6	54.6	September .....	73.2	58.2			
May .....	51.2	52.6	October .....	55.3	59.3			

These temperatures, compared with those of 1898, show that the annual mean temperature of both stations for the two years is practically 55°, which is also the mean annual temperature, so far as we can judge from somewhat scattered data, of the ocean in the vicinity of San Francisco. The temperature of the lower station naturally approximates sea conditions throughout the year, while the departures at the more elevated station are marked in both winter and summer.

The highest temperature recorded on the mountain during the year was  $96^{\circ}$ , on July 18; the maximum temperature on the same date at San Francisco being  $66^{\circ}$ , and at Point Reyes  $52^{\circ}$ . It is worthy of note that within so short a distance as 25 miles, between Mount Tamalpais and Point Reyes, there should be a difference of  $44^{\circ}$ . The highest temperature recorded at San Francisco during 1899 was  $94^{\circ}$  on October 8, while on this date the maximum temperature on Mount Tamalpais was  $88^{\circ}$ , and at Point Reyes  $74^{\circ}$ . The lowest temperature recorded during the year on the mountain was  $23^{\circ}$ , on February 4, and on the same date  $34^{\circ}$  at San Francisco and at Point Reyes. The minimum temperature was, therefore,  $11^{\circ}$  lower at the higher station. As has been elsewhere stated, during summer months there is very frequently, owing to the fog, a cooling of  $11^{\circ}$  at the lower station. In all of these instances the retarding influence of the water is apparent, in summer the temperature near the sea remaining cool, and comparatively warm in winter.

Including every day in the month of June there was found to be a mean daily difference of  $11.4^{\circ}$ , or in other words from the data obtained by means of this mountain station, checked by data from Point Reyes and Mount Hamilton, the temperature rose at the rate of  $1^{\circ}$  for every 203 feet of elevation. This increase held at least up to 2,380 feet.

If we consider only those days in the month (twenty-four) when there was a rise with elevation, we have for the mean daily difference in temperature between Mount Tamalpais and San Francisco  $15.3^{\circ}$ , i. e., the temperature rises  $1^{\circ}$  for every 155 feet elevation. This may be adopted as a working normal summer-day gradient.

For days when there was a decrease in temperature with elevation, six in all, we find a difference of  $5.9^{\circ}$ , or there was  $1^{\circ}$  fall for every 402 feet, which, it may be noted, is not quite as steep a gradient as values generally given in text-books,  $1^{\circ}$  for every 300 feet.

We notice first that periods of rainy or cloudy and cold weather occur when the surface temperatures are higher than those of the upper level. It would seem as if at these times the different air strata from sea level to 2,500 feet had been intermingled to some degree and the cold layer usually existing close to the surface had been temporarily displaced.

Fogs seem to occur at times of steep inverted gradients; in other words, when the temperature of the 2,500-foot level is considerably higher than at sea level.

The conclusion to be drawn from what precedes is that the summer fogs of San Francisco result from the chilling of the upper warm air over the ocean by the water, particularly the cold current close to the shore. The strong indraft through the Golden Gate on summer afternoons (see charts of hourly wind velocity, 3 to 7 p. m., fig. 6) carries with it the fog. The movement of the lower fog-laden air eastward and into the valley is compensated by a westward air movement at higher levels. The great difference of temperature between the valley and the ocean, often  $50^{\circ}$  within as many miles, is probably the prime factor in controlling the circulation.

The mountain, as might be supposed, is the drier station, the mean relative humidity being 59 per cent, while it is 83 per cent at San Francisco. Especially during the summer months is the difference noticeable, and, doubtless, it is this dryness which causes such an agreeable "change of climate" to visitors at this season. The difference may perhaps be stated more clearly in this way: The weight of water vapor per cubic foot varies from 1.9 grains to 3.5 grains on the mountain during the year, while at San Francisco it varies from 3.3 grains to 4.4 grains. The average hourly wind velocity seems to increase with elevation, the values for the mountain station far exceeding those of the lower station. The maximum velocities recorded are, respectively, 91 and 47 miles per hour. The total wind movement was 177,017 miles at Mount Tamalpais and 96,602 miles at San Francisco.

## CLIMATOLOGY OF CALIFORNIA.

## COMPARATIVE DATA.

## MOUNT TAMALPAIS, 1899

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
Mean actual pressure . . . . .	27.62	27.65	27.53	27.54	27.53	27.51	27.50	27.49	27.56	27.52	27.55	27.62	27.55
Mean maximum temperature . . . .	51.8	53.3	49.5	56.6	58.1	73.9	78.2	68.5	79.9	60.7	52.9	52.3	61.5
Mean minimum temperature . . . .	43.8	41.9	39.6	44.7	44.3	59.6	63.7	54.2	66.6	49.9	45.9	43.1	49.8
Mean monthly temperature . . . . .	47.8	47.6	44.6	51.6	51.2	66.8	71.0	61.4	73.3	56.3	49.4	47.7	55.7
Highest temperature . . . . .	69	71	69	77	82	86	96	79	92	88	61	64	96
Lowest temperature . . . . .	32	23	32	32	33	41	46	45	47	37	40	34	23
Dew-point . . . . .	34	29	36	35	35	39	33	39	32	37	46	41	36
Relative humidity . . . . .	70	56	77	58	62	43	30	50	29	63	91	80	59
Total rainfall . . . . .	5.92	0.28	10.38	1.89	1.70	0.29	0.00	0.01	0.00	4.26	7.48	4.65	36.86
Greatest 24-hour rainfall . . . . .	1.54	0.14	2.51	0.53	1.39	0.24	0.00	0.01	0.00	1.32	2.51	0.83	2.51
Mean cloudiness . . . . .	6.0	3.4	6.7	4.7	4.1	1.8	1.2	2.3	2.0	4.6	8.0	4.6	4.1
Average hourly wind velocity . . . .	24.0	23.2	22.8	19.8	22.9	19.8	17.6	16.5	17.1	18.2	16.7	23.9	20.2
Prevailing wind direction . . . . .	NW	NW	W	N	NW	NW	NW	W	NW	NW	NW	NE	NW.
Maximum wind velocity . . . . .	86	84	76	84	78	86	61	91	66	71	56	76	91
Maximum wind direction . . . . .	W	NW	NW	NW.	NW.	NW	N	NW.	NW	NW.	W.	N	NW.
Clear days . . . . .	8	14	7	13	17	24	29	24	26	16	2	16	196
Partly cloudy days . . . . .	9	13	7	8	9	5	2	4	4	5	10	4	80
Cloudy days . . . . .	14	1	17	9	5	1	0	3	0	10	18	11	89
Days with 0.01 inch rainfall . . . .	14	4	17	7	3	3	0	1	0	11	19	13	92
Days with 0.04 inch rainfall . . . .	14	2	16	6	3	1	0	0	0	8	15	12	77
Actual hours sunshine . . . . .	174.9	263.8	162.6	300.7	344.6	404.5	445.4	373.4	354.7	234.0	105.9	177.7	3,342
Percentage of sunshine . . . . .	57	87	44	70	78	91	99	88	95	67	35	60	73
Mean daily range of temperature . .	8.0	11.4	9.9	13.9	13.8	14.3	14.5	14.3	13.3	10.8	7.0	9.3	11.7
Mean daily change of temperature . .	2.8	3.8	4.1	6.3	4.7	6.1	5.9	4.7	3.4	4.2	2.1	3.1	4.3
Total wind movement . . . . .	17,821	15,608	16,956	14,234	17,074	14,257	13,108	12,283	12,307	13,501	11,996	17,782	177,017

## SAN FRANCISCO, 1899

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
Mean actual pressure . . . . .	29.98	30.00	29.89	29.87	29.87	29.78	29.78	29.78	29.83	29.83	29.88	29.98	29.87
Mean maximum temperature . . . .	58.3	58.0	57.3	61.2	58.3	63.4	61.5	63.5	65.1	66.1	61.0	54.8	60.7
Mean minimum temperature . . . . .	47.6	45.3	47.1	47.9	46.9	50.4	50.3	53.1	51.3	52.5	52.0	44.4	49.1
Mean monthly temperature . . . . .	53.0	51.6	52.2	54.6	52.6	56.9	55.9	58.3	58.2	59.3	56.8	49.6	54.9
Highest temperature . . . . .	78	80	74	80	80	75	73	78	73	91	65	63	94
Lowest temperature . . . . .	40	34	42	43	43	47	43	50	43	46	43	37	34
Dew-point . . . . .	46	45	48	45	45	49	50	52	52	50	52	44	48
Relative humidity . . . . .	80	82	86	76	79	83	87	84	89	78	86	83	83
Total rainfall . . . . .	3.87	0.10	7.61	0.62	0.86	0.01	0.00	T.	0.00	3.92	3.79	2.65	23.23
Greatest 24-hour rainfall . . . . .	0.98	0.08	2.15	0.46	0.77	0.01	0.00	T.	0.00	1.94	1.51	1.17	2.15
Mean cloudiness . . . . .	6.7	4.6	6.5	3.0	2.6	2.0	3.6	3.3	3.0	3.0	5.3	3.3	4.0
Average hourly wind velocity . . . .	7.9	8.7	9.8	11.7	13.9	14.2	15.3	14.4	12.6	8.5	6.6	3.6	11.0
Prevailing wind direction . . . . .	SE	W	W.	W	W	W	SW.	SW.	SW.	W.	SE.	N.	W.
Maximum wind velocity . . . . .	47	39	30	38	37	44	41	39	40	41	30	30	47
Maximum wind direction . . . . .	SW	W.	W	W	W.	W.	W	W	W	W.	SW.	SW.	SW
Clear days . . . . .	5	11	6	13	21	23	16	18	20	21	8	13	185
Partly cloudy days . . . . .	11	10	9	10	7	5	11	11	8	5	11	6	104
Cloudy days . . . . .	15	7	16	2	3	2	4	2	2	5	11	7	76
Days with 0.01 inch rainfall . . . . .	11	2	15	5	2	1	0	0	0	9	12	10	67
Days with 0.04 inch rainfall . . . . .	9	1	10	3	2	0	0	0	0	6	11	10	52
Actual hours sunshine . . . . .	152.1	215.7	192.9	327.7	365.1	382.4	294.1	308.4	232.5	272.5	129.1	190.5	312.3
Percentage of sunshine . . . . .	50	71	52	83	83	86	65	73	73	78	42	64	69
Mean daily range of temperature . .	10.7	12.7	10.2	13.3	11.4	13.0	11.3	10.4	13.8	13.6	8.4	10.4	11.6
Mean daily change of temperature . .	2.0	3.1	2.6	4.3	2.2	3.1	2.1	2.0	2.2	3.4	1.9	2.3	2.6
Total wind movement . . . . .	5,864	5,660	7,316	8,394	10,346	1,019	11,356	10,722	9,066	6,298	4,757	6,430	96,602

## SUNSHINE AT MOUNT TAMALPAIS FOR 1899 AND 1900

[N lat 37° 56']

	Percentage of sunshine recorded during hours ending (local time)—																Total (hours)	Per- centage of pos- sible
	5h a m	6h	7h	8h	9h	10h	11h	Noon	1h	2h	3h	4h	5h	6h	7h	8h		
1899																		
January . . . . .	...		..	60	57	56	62	60	57	57	54	57	49	72	...	...	174 9	57
February . . . . .			78	85	88	90	90	85	88	90	91	98	81	77	..	...	263 8	87
March . . . . .		25	26	46	48	47	43	41	45	55	50	49	50	27	4	...	162 6	44
April . . . . .	...	21	50	78	77	76	76	80	86	85	89	91	89	88	48	....	300 7	76
May . . . . .	47	45	72	81	83	81	79	72	84	85	88	88	92	90	64	11	344 6	78
June . . . . .	84	84	87	87	86	87	87	89	95	99	97	97	97	98	96	78	404 5	91
July . . . . .	95	94	97	98	100	100	100	100	100	100	99	100	99	100	100	96	445 4	99
August . . . . .		66	87	87	92	94	91	88	88	91	92	98	95	94	76	29	373 4	88
September . . . . .		96	94	88	96	98	98	100	98	98	97	96	94	85	85	...	354 7	95
October . . . . .		100	59	58	64	61	66	69	71	76	76	75	65	64	...	...	234 0	67
November . . . . .			31	30	31	33	38	35	36	40	35	39	39	100	...	....	105 9	35
December . . . . .	...		82	54	56	62	63	62	64	63	58	59	55	...	...	...	177 7	60
Sum . . . . .	226	531	768	852	878	885	893	881	912	939	926	937	898	890	478	214	3,342.3	877
Percentage of pos- sible . . . . .				71	73	74	74	73	76	78	77	78	75		...	...	278 5	73
1900																		
January . . . . .	...			44	48	50	49	55	56	63	65	62	52	46	...	...	165 7	55
February . . . . .			67	69	72	67	62	60	74	73	69	69	62	61	...	...	203 8	67
March . . . . .		100	79	71	72	77	76	72	73	77	74	74	66	62	76	...	270 4	73
April . . . . .		53	56	56	62	66	69	66	65	69	70	69	61	58	55	...	249 1	63
May . . . . .	88	68	67	71	70	73	71	69	72	75	77	81	80	72	70	96	322 2	73
June . . . . .	66	62	62	69	67	73	79	73	81	86	86	85	86	85	76	78	338 0	76
July . . . . .	96	94	95	94	94	95	97	93	94	98	95	91	91	91	88	89	419 7	93
August . . . . .		80	81	81	83	86	88	86	91	94	98	90	87	84	85	100	384 9	86
September . . . . .		59	69	69	69	75	72	66	76	79	76	76	77	71	60	...	270 5	73
October . . . . .		0	60	61	71	74	76	72	74	75	72	74	65	59	...	...	243 3	70
November . . . . .		...	64	46	46	52	51	50	49	48	59	59	49	0	...	...	155 9	51
December . . . . .		...	100	56	59	60	65	51	59	66	62	60	60	...	...	...	178.7	60
Sum . . . . .	250	516	800	787	813	848	855	816	864	903	898	890	836	689	510	363	3,181.7	840
Percentage of pos- sible . . . . .	...		...	66	68	71	71	68	72	75	75	74	70	...	...	...	265 1	70

The following notes on "Fog at Mount Tamalpais" are reprinted from the Monthly Weather Review, November, 1900, and January, February, and March, 1901:

In fig. 21, Plate I, is shown perhaps the most common type of fog. It may be of interest to compute roughly the weight of water vapor existing under such conditions. From a number of records, a fair average dew-point temperature is  $51^{\circ}\text{F.}$  ( $10.6^{\circ}\text{C.}$ ). It is estimated that an area 10 miles east and west and an equal distance north and south is covered with fog. The upper level of the fog may be taken as half a mile. If the fog were solidly packed, we could not be much in error if we estimated its bulk at 50 cubic miles.

There are, therefore,  $5280^3 \times 50$  cubic feet of water vapor at a mean temperature of  $51^{\circ}\text{F.}$  A cubic foot of vapor at this temperature weighs 4.222 grains, and we therefore have as a gross weight 2,219,535 tons of 2,000 pounds each. But most generally the fog disappears between sea level and 1,200 to 1,500 feet altitude, and there are also wide swaths or channels fog free. The amount given above, therefore, would need to be cut in two, and a liberal estimate of the weight of the water vapor in a fog outside the Heads is 1,000,000 tons. This is carried through the Golden Gate by westerly winds, blowing 22 miles per hour, from 1 to 5 p. m.

For each square mile of surface there would be about 10,000 tons of water vapor and for each acre about 15.63 tons. This is equivalent to a rainfall of 0.14 inch.

In Waldo's Modern Meteorology<sup>a</sup> an example in the use of Hertz's graphical tables for following the changes in a given quantity of water vapor under varying conditions is given. With little change, the problem will apply in this case.

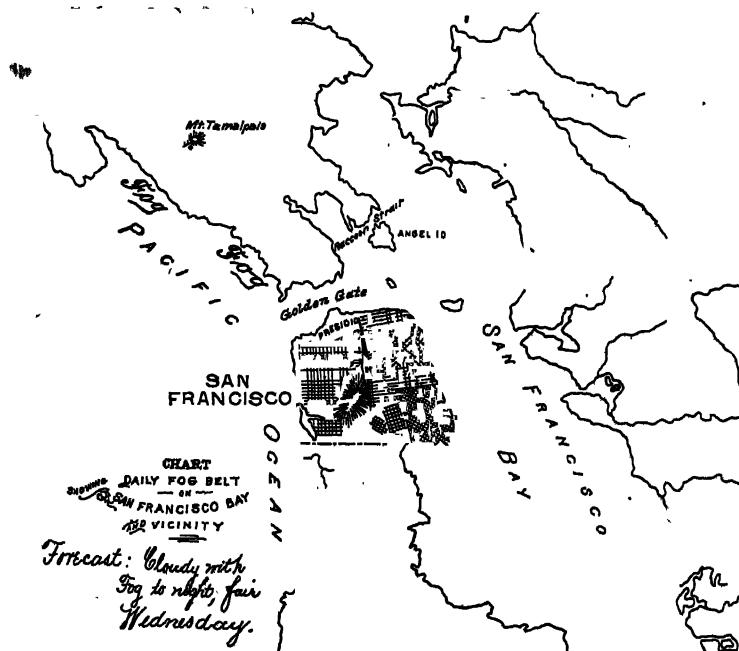


FIG. 20.—Fog service at San Francisco. Corner of large map standing in main corridor of Ferry Building. By means of frequent reports from Point Reyes and Mount Tamalpais the extent and character of fog over Drakes Bay, the roadstead, and the Gate itself are known in the city.

At San Francisco the mean actual pressure is 29.87 inches (758.7 mm.) and at Tamalpais 27.55 inches (699.8 mm.); the elevation of the latter station is 724 meters, and the former is practically at sea level.

With a pressure of 750 mm. and a temperature of  $27^{\circ}\text{C.}$  ( $80^{\circ}\text{F.}$ ), a given mass of air, half saturated, lifted upward under adiabatic conditions, will not change its initial 11 grams of water contents per kilogram until at an elevation of 640 meters, when condensation would begin. At an elevation of 700 meters, the pressure being 687 mm., the temperature would be  $19.3^{\circ}\text{C.}$  ( $67^{\circ}\text{F.}$ ).

At 640 meters the dew-point would be  $13.3^{\circ}\text{C.}$  ( $56^{\circ}\text{F.}$ ) or  $2.5^{\circ}\text{C.}$  lower than the initial dew-point  $15.8^{\circ}\text{C.}$  ( $60^{\circ}\text{F.}$ ), the difference being due to the increased volume. At 1,000 meters the temperature would be  $8.2^{\circ}\text{C.}$  ( $49^{\circ}\text{F.}$ ), or at a rate of  $0.51^{\circ}\text{C.}$  decrease per 100 meters elevation.

It is pointed out, however, that in all theoretical values the assumption is made that the kilogram of mixed air and water vapor retains its mass unchanged, but this can not be the case with a mixture in free air performing a journey of any extent. It is also to be remembered that in the actual case before us the horizontal movements of the given mass would be of far more significance than the vertical movements.

<sup>a</sup> Page 236. The paper in full is translated in Professor Abbe's Mechanics of the Earth's Atmosphere, No. XIV, pp. 198-211. [Improved methods are given by Professor Bigelow in his Report on the International Cloud Observations. Washington. 1900.]

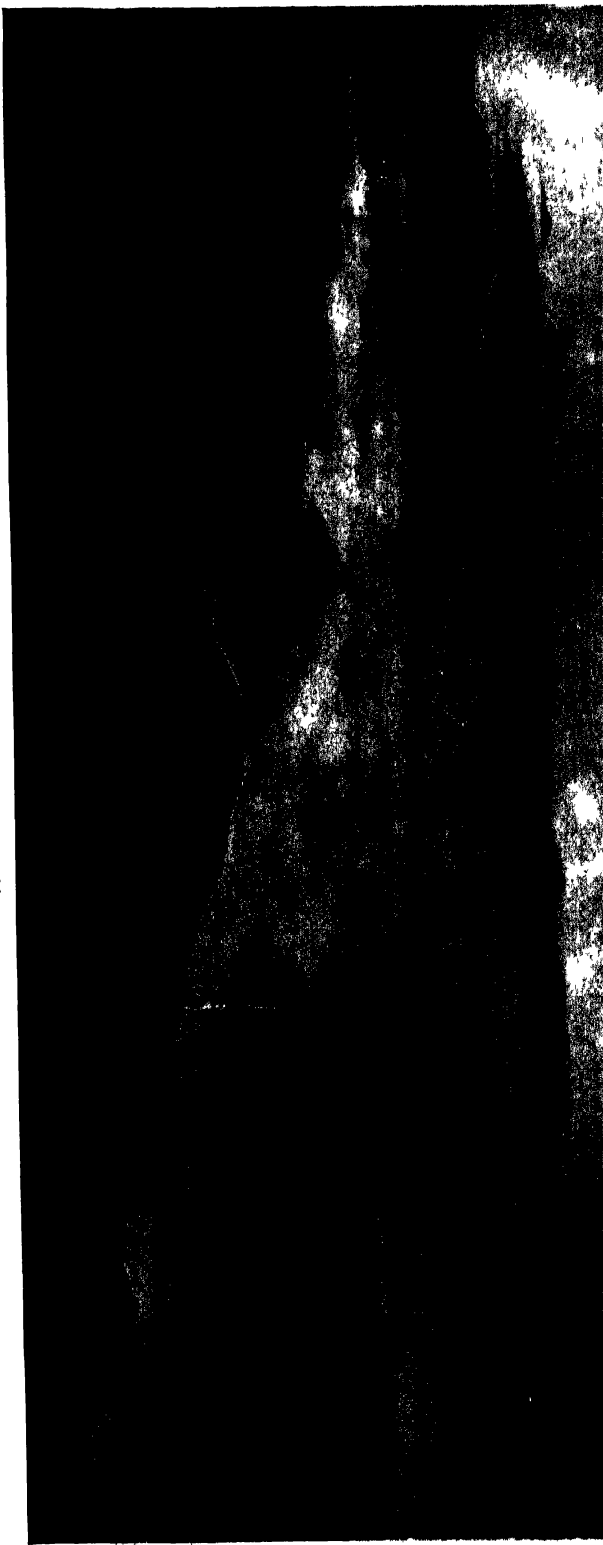


FIG 21.—MORNING FOG OVER VALLEYS.



FIG 22.—LIFTED FOG HEIGHT ABOVE GROUND ABOUT 500 METERS





FIG. 23.—SEA FOG POURING OVER SAUSALITO HILLS AND THROUGH GOLDEN GATE.



FIG. 24.—FOG WAVES.



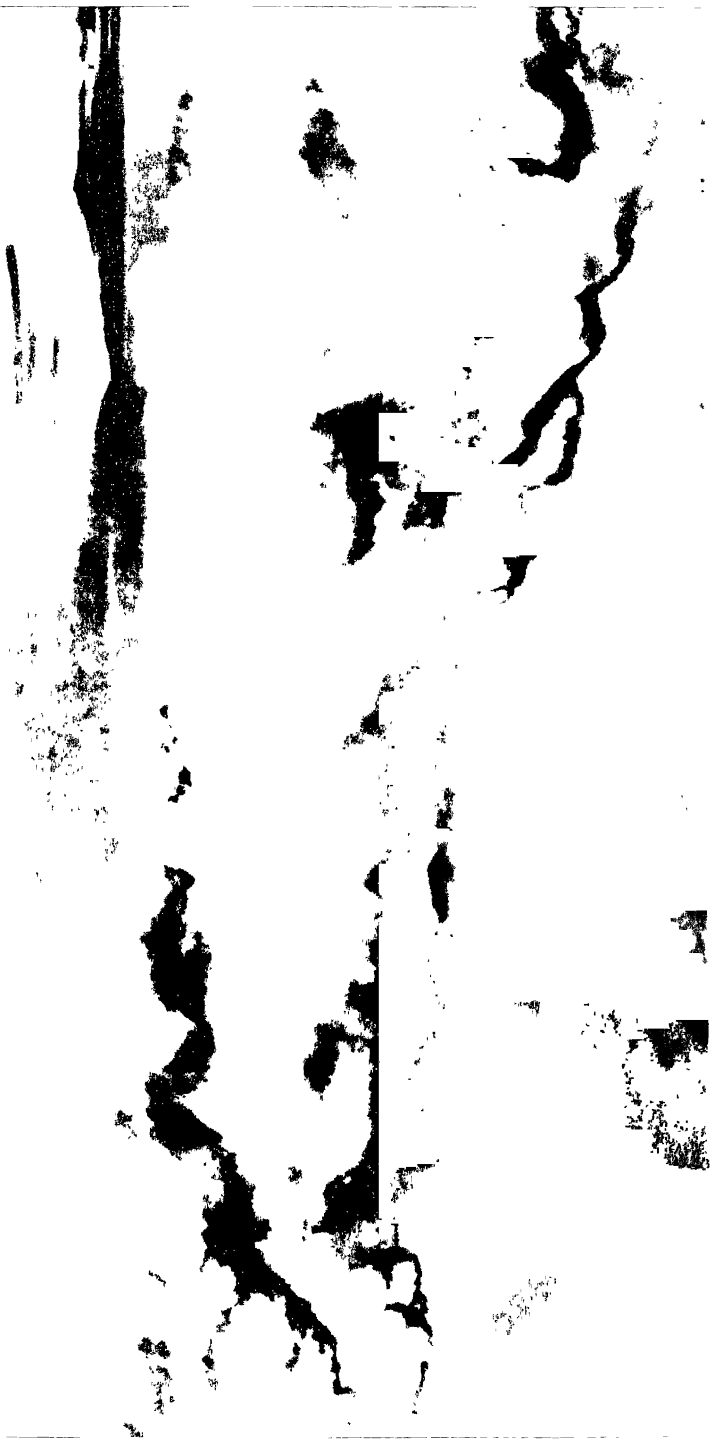


FIG. 25.—FOG LIFTING. VIEW FROM U. S. WEATHER BUREAU, MOUNT TAMALPAIS, CALIFORNIA.



In Von Bezold's third paper on the "Thermodynamics of the atmosphere" (see *Mechanics of the Atmosphere*, pp. 257-288) the effect of mixing different air masses is considered. If two masses of saturated air at  $0^{\circ}\text{C}$ . and  $20^{\circ}\text{C}$ ., respectively, and at 700 mm. pressure are thoroughly mixed, the greatest amount of rainfall that can occur is 0.75 gram per kilogram of air and water vapor. The temperature of the mixture will be  $11^{\circ}\text{C}$ . ( $52^{\circ}\text{F}$ .). The warmer mixture would have yielded the same amount of rainfall by raising it 310 meters or cooling it  $1.6^{\circ}\text{C}$ . by elevation and  $0.8^{\circ}\text{C}$ . by contact.

Direct cooling by contact or radiation is shown by Von Bezold to be more efficient as a cause of rainfall than cooling by mixture, but in the production of fog it is probable that cooling by mixture (except in the case of ground fogs) is the most important factor to be considered. It is to be noted that reverse pressures should also be studied, for perhaps a close watch upon the conditions prevailing when fog is rapidly dissipating might conversely throw light upon the order and relative importance of the three ways of cooling, viz, mixture, expansion, and radiation.

Von Bezold's deductions may be thus summarized: More vapor condenses when a stream of air and vapor at low temperature impinges on a mass of warmer air than with reversed conditions. Ocean fogs as a rule form when cool air flows over warm, moist surfaces, but in the case under discussion, where the ocean surface temperature is  $13^{\circ}\text{C}$ . ( $55^{\circ}\text{F}$ .) and the air temperature may reach  $27^{\circ}\text{C}$ . ( $80^{\circ}\text{F}$ .), it is evident that the above does not hold. It is more probable that condensation is the result of the sharp temperature contrasts at the boundaries of certain air currents having different temperatures, humidities, and velocities, and that the contours of the land play an important part in originating and directing these air currents. The summer afternoon fogs of the San Francisco Bay region, then, are probably due to mixture more than radiation or expansion. The winter tule fogs of the Sacramento and San Joaquin valleys are probably pure types of radiation fog, where the process of cloud building is from the cooled ground upward. Occasionally in summer, when the warm air has been pumped out of the valleys and there is rapid radiation, ground fog forms. An illustration of this is given in fig. 22, Plate I, where fog covers a number of valleys. Summer sea fog is shown in fig. 23, Plate II, and, as said above, is probably due to mixture. The wave motions or Luft Wogen of Von Helmholtz are shown in fig. 24, Plate II, and also the surgings or splashing, where a certain condensation results from the mechanical uplifting.

In several papers presented to the Royal Academy of Sciences of Prussia, Prof. H. von Helmholtz has discussed the conditions which must occur in the atmosphere where strata of different densities lie close together, with particular reference to the billow and wave effects near the limiting surfaces of the strata.

"It appears to me not doubtful,"<sup>a</sup> says Helmholtz, "that such systems of waves occur with remarkable frequency at the bounding surfaces of strata of air of different densities, even although in most cases they remain invisible to us. Evidently we see them only when the lowest stratum is so nearly saturated with aqueous vapor that the summit of the wave, within which the pressure is less, begins to form a haze."

It is probable, as Helmholtz states, that conditions favorable for the origin and propagation of air waves often exist, but with the exception of certain cloud forms it is seldom that the meteorologist has an opportunity to see this wave action clearly defined. It therefore seems of importance to present a few photographs showing the actual wave effects produced probably by the sharp contrasts of air currents of different densities in the vicinity of Mount Tamalpais.

It is thought that in the photographs of fog billows (Plates III and IV) there is evidence of the movement of rectilinear waves propagated, with little change of form and velocity, along the bounding surfaces of the different air strata.

With a wind velocity of 10 meters per second, which nearly corresponds with the mean velocity of the inflowing colder current (the average summer afternoon velocity of the wind through the Golden Gate is about 22 miles per hour), the wave length,  $\lambda$ , is determined by Von Helmholtz to be about 900 meters (2,950 feet). The wave lengths shown in the various fog photographs herewith are of corresponding magnitude and vary, it is estimated, from 100 to 2,000 meters. Helmholtz states further:<sup>b</sup>

"Since the moderate winds that occur on the surface of the earth often cause water waves of a meter in length, therefore the same winds acting upon strata of air of  $10^{\circ}$  difference in temperature maintain waves of from 2 to 5 kilometers in length."

Equations for the velocity of propagation and the diminution of the speed with a change of the depth of the lower stratum and a discussion of the energy of the waves are given for special cases. It is also pointed out that the elevations of the air waves can amount to many hundred meters, and that precipitation could thus be mechanically brought about. The same wind can excite waves of different lengths and velocities, and the interference and reinforcement may perceptibly modify the wave form. One of the processes by which waves of great height can be formed is thus pointed out by Helmholtz, namely, where two wave summits of different groups of waves reinforce each other. The wave height may be so great that foaming is produced. Such long and deep waves may have a bearing on the explanation of certain local and nonperiodic disturbances.

The demonstrated existence of these air billows and waves is important also in connection with the transmission of other air waves. It is well known that sound waves are reflected and refracted in a marked degree in the vicinity of fog banks, fog walls, and fog billows. The inaudibility of fog signals from sirens is one of the greatest sources of danger and anxiety in navigation. Any increase in our knowledge of the dispersion and aberration of these fog signals will be hailed with joy by many thousand travelers. In the vicinity of San Francisco, as evidenced by the

<sup>a</sup> See Abbe's *Mechanics of the Earth's Atmosphere*, p. 94.

<sup>b</sup> See *Mechanics of the Earth's Atmosphere*, p. 103.

series of photographs accompanying these papers, the opportunities for studying the general aberration of sound waves in fog are excellent. It is our earnest hope that in due time some experimental work in this direction may be undertaken at the observatory on Mount Tamalpais. Some very strange effects have already been noticed with regard to the noise of a train when traversing different air strata.

Zones of audibility appear to be quite sharply marked, even after making allowance for the many canyons and "mesas" (tablelands). On foggy days these zones are greatly modified. In addition to changes in density and temperature which sound waves would experience, there are changes due to the movement of the sound-conveying medium. The strong air currents moving toward the listener increase the frequency of vibration and raise the pitch, conversely the air currents moving away from the listener flatten the note.

There have been several instances on nights without fog where ordinary sounds have been heard distinctly at a distance of nearly two miles. On other occasions it has been possible to obtain echoes from hills distant one-half mile or more when the intervening valley was covered with fog. The echoes could not be heard when the fog was absent.

The accompanying photographs may throw light upon the much-discussed question of the abnormal aberration of fog signals. It will be remembered that Prof. Joseph Henry, who for twelve years served as chairman of the Light-House Board, thought that the wind played a more important part in the abnormal aberration of sound waves than the so-called acoustic clouds described by Professor Tyndall. It is probable that up to a certain point both explanations may hold, but the wind is seemingly the more active factor in most cases. Sound moving with the wind is refracted downward and moving against the wind refracted upward.<sup>a</sup>

From the great mass of conflicting evidence it appears that a homogeneous atmosphere without the internal stream lines (see reference to this under "Air drainage," in previous pages) conveys sound waves very well; but this is not the usual condition. Under normal conditions the mass of air within a mile or two of a light-house and extending upward half a mile is neither still nor homogeneous. One of the main purposes of the accompanying fog photographs is to show the stratification, faulting, and upheaval effects due to differences of temperature and density caused by extensive and rapidly moving currents. Of course the aberration of audibility of fog signals due to changes of the sound-conveying medium is not to be confounded with the aberration in audibility due to topographical features and the normal reflection and refraction of sound waves. Probably within a short distance of every light-house there are zones or points of inaudibility due to the latter causes. An excellent illustration of this can be found in a paper on Fogs and Fog Signals of the Pacific Coast, by Ferdinand Lee Clarke.<sup>c</sup> It is there shown that the sirens around the Golden Gate and in San Francisco Bay are inaudible at certain points. Here, there is an interference of sound waves due to numerous natural reflections.

It has been suggested that if the fog signals at Lime Point and at Point Bonita were properly attuned a resulting harmonic might be heard at certain points instead of the weakened noise now heard. We need measurements of the energy producing the air pulsation, the proportionate energy reaching the ship or given point, and the rate of expenditure with different conditions of density and air movement. By the employment of suitable resonators the pulsations reaching the ship might be more easily detected. With the introduction of etheric telegraphy it would almost seem practicable to obtain by this same principle of resonance electromagnetic signals, and by comparing the time intervals between these and the sound waves in air or transmitted through water the distance apart of the vessels or the distance from the shore might be determined within a few feet.

The velocity of sound, it is generally stated, is within wide limits practically independent of both intensity and pitch. In dry air at 0° C., according to Rowland, the velocity of sound propagation is 331.78 meters (1,090 feet) per second. In water vapor at 10° C., according to Masson, the velocity is about 402 meters (1,318 feet) and at 96° C. 410 meters (1,345 feet) per second. In water at 10° C. the velocity is about 1,435 meters (4,708 feet), in copper about 3,560 meters, and in glass from 5,000 to 6,000 meters.

The velocity is proportional to the square root of the absolute temperature, as given by the formula:

$$a = a_0 \sqrt{1 + \frac{\theta}{273}}$$

where  $a$  = velocity of sound

$a_0$  = velocity of sound at 0° C

The velocity of sound propagation in dry air is therefore about 37 times more rapid than that of the average summer afternoon winds (20 miles per hour), which blow through the Golden Gate with such regularity and which are the prime disturbing factors in the circulation of the air in this vicinity. The question of refraction of sound in free air has been independently studied by Stokes,<sup>a</sup> Taylor,<sup>b</sup> Henry,<sup>c</sup> Tyndall,<sup>d</sup> and Reynolds,<sup>e</sup> and many of the puzzling phenomena connected with the aberration of sound can be demonstrated to be caused by the bending of the sound beams in traversing air strata of varying temperatures and motions. The most efficient cause of loss of audibility is wind. The loss is not due to an actual retardation of the sound waves by the movement of the air so much as to a refraction of the wave front upward from the earth. Sound traveling with the wind is bent downward and traveling against the wind is bent upward. Knowing this, we are able, by lifting the position of the hearer,

<sup>a</sup> Report British Association, 1857

<sup>b</sup> Smithsonian Report, 1875

<sup>c</sup> Smithsonian Report, 1877

<sup>d</sup> Philosophical Transactions, 1874.

<sup>e</sup> Philosophical Transactions, 1876.

sometimes to make sound audible against the wind. Thus Henry shows that a sound moving against the wind, inaudible to the ear on the deck of a vessel, could be heard at the masthead. Reynolds's experiments even more conclusively demonstrate the bending of the wave front downward as a rule when moving with the wind and upward when moving against the wind.

The accompanying photographs, Plate V, figs. 27 and 28, show air strata moving with varying velocities. As a rule the upper currents have the greater velocity, but not infrequently this condition is reversed. In such cases audibility should be favored even by an opposing wind, and this is sometimes found to be the case. Thus far we have alluded only to the refraction of the wave fronts due to varying air velocities; but the varying temperatures of the different air masses will also affect the relative audibility. Reynolds instances a marked case, where, owing to a thorough cooling of the lower air strata, and presumably a marked inverted temperature gradient, the audibility was excellent, the sound being refracted downward, and all objects "looming," as it were. It is even possible to work out the retardation or acceleration of the wave front with the degree of variation in temperature. Finally, it may be that the temperature and the air motion may act together to refract downward the sound wave, and it may also happen that the one influence may oppose the other. Thus Reynolds gives an example where, with a heavy dew on the ground, sound could be heard equally well against a light wind as with the wind—

"Showing that the upward refraction by the wind was completely counteracted by the downward refraction from the diminution of temperature. This was observed not to be the case when cloudiness at night prevented terrestrial radiation." (Proc. R. S., 1874.)

The presence of large quantities of condensed water vapor brings us to the question of refracting surfaces and the reverberation of the sound rather than its velocity.

When a sound wave travels over a perfectly smooth surface, such as a glassy sea, or a sharply outlined plane of condensation, the intensity of the sound does not diminish with the usual rapidity. In discussing the propagation of sound in whispering galleries, Rayleigh<sup>a</sup> shows that the abnormal loudness is not confined to a point diametrically opposite that occupied by the speaker, but that there is a bending or clinging of the sound waves to the surface of the concave wall. Sonorous vibrations at fog surfaces and cloud surfaces may behave in a somewhat similar way, and it is probable that the curvature of the surface is not of as great importance as the comparative smoothness of the surface. Probably the roll of thunder is an excellent illustration of continued reverberation at cloud surfaces.

#### WRECK OF THE PACIFIC MAIL STEAMSHIP "RIO DE JANEIRO."

Any memoir upon the fog of San Francisco Bay would be incomplete without a reference to one of the most remarkable of marine accidents. On the morning of Friday, February 22, 1901, the Pacific Mail steamship *Rio de Janeiro* ran upon the Fort Point Reef during a fog. Within fifteen or twenty minutes from the time of striking the vessel sank, and of the 210 persons on board 130 were lost. Another statement, purporting to be official, makes the total number aboard 207 and the lost 127.

The following facts are obtained chiefly from the statements of Pilot F. W. Jordan. The ship's master, Capt. William Ward, went down with the vessel. The pilot boarded the *Rio de Janeiro* in the vicinity of the 9-fathom buoy, near the bar buoy, and anchored in 13 fathoms at a little before 6 o'clock Thursday night, February 21. The weather being foggy, the ship remained at anchor till about 4 a. m., one hundred and twentieth meridian time, when the fog lifted and the Cliff House light could be seen, but not the Point Bonita light. Preparations were in progress to steam into the harbor, when a dense fog came out from the Golden Gate, obscuring everything. There is some difference of testimony as to whether the captain or the pilot gave the orders to proceed in the fog, but the vessel was started on a northeast course with Lime Point straight ahead, steering by the whistle. The pilot expected to get an echo of the ship's whistle from Point Diablo, but heard none. The course was changed north-northeast with the intention of running close to Lime Point. The vessel was not moving at full speed and was subject to a strong cross current, which, apparently acting at right angles to the length of the vessel, carried the ship to the south, far out of the proper course. The first officer was standing on the starboard side listening for the Fort Point bell. No soundings, however, were taken. The vessel struck a short distance to the southwest of the Fort Point light. At the moment of striking the pilot saw the white flash at Fort Point and heard the Fort Point bell.

The pilot had had eleven years' experience in the harbor and was considered one of the most capable pilots in San Francisco. He had never previously met with an accident. There appears to be no doubt of the existence of the strong cross current, inasmuch as other vessels entering

<sup>a</sup>Theory of Sound, vol. 2, sec. 287.

the harbor about the same time on the same morning came near going on the rocks. The Pacific Mail Steamship Company has a rule that vessels must not enter or leave a harbor when fog prevails. On the morning in question the fog lifted for a few moments and then settled down again; but by 9 a. m., local time, the fog had dissipated. The rest of the day was clear and balmy and the water as smooth as a mill pond.

The vessel struck about 5.30 a. m., with the pilot and captain on the bridge, the first officer on the starboard side of the bridge listening for the bell, and the second officer at the telegraph. When the vessel struck, the captain blew the danger whistle, a long blast. Ordinary fog blasts (long enough to count six or seven) had been blown previously.

The details of the accident, particularly with reference to the whistles, the course steered, and the motion of the current, are given, because from such evidence as can be obtained at this writing it appears that even after the vessel struck the sound of the whistle was not heard plainly at Fort Point, not more than half a mile distant, where a lookout of the life-saving station was on duty and where a life-saving crew could have hurried to the rescue and probably reached the ship within five minutes, without doubt saving many of those whose lives were lost. There was also a sentry walking post within a short distance of the lookout. It is stated that some soldiers heard voices and also a whistle, but the evidence is very conflicting, and it seems improbable that if the long danger blast was clearly heard it should pass without notice and subsequent action.

The Weather Bureau records show that about the time of the accident a mongrel tule fog prevailed over the Bay of San Francisco. At Mount Tamalpais the weather was clear, with a wind of 13 miles per hour from the northwest. At San Francisco dense fog prevailed, with little, if any, wind. The wind vane at the Mills Building indicated a southwest wind blowing about 1 mile per hour. From 1 a. m. to 6 a. m. but 9 miles of wind were recorded.

When all is said and done it appears that the fog was the prime factor in causing the loss of the vessel. Owing to the aberration of the sound waves in the fog the pilot was unable to hear the fog signals from either Point Bonita or Lime Point to the north, or the tolling of the bell at Fort Point to the east and north. It has not, however, been shown that the bell was certainly ringing. The Lime Point whistle has great penetrative power. The fog bell at Fort Point is 40 feet above the water, and should be heard for at least a mile. It is supposed to be struck every ten seconds. It is a strange fact that in a paper upon the Fogs and Fog Signals of the Pacific Coast, by Ferdinand Lee Clark, published in 1888, there should occur this statement concerning the fog bell at Fort Point.

In point of fact it is said to be hardly ever heard except when too late to be of use \* \* \* If mariners depended upon its sound to tell them how near they were to the point, they would generally have no time after hearing it to clear the danger.

The loss of the *Rio de Janeiro* proves that the bell at Fort Point in its present position is sometimes of little value.

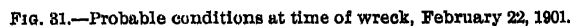
The temperature at the time of the accident was 50° F. at sea level and 52° at a height of 2,500 feet. The thickness of the fog probably did not exceed a few hundred feet; and, as indicated above, it was a land fog rather than a sea fog.

As a general thing the reflected sounds from Point Bonita and Lime Point are heard better on the south side of the channel. On the accompanying rough sketch of the channel the lines of natural reflection are drawn and also the zones of inaudibility.

It is not difficult to account for the failure of the echo of the ship's whistle from some portion of the northern shore, as the distance of the vessel from Point Diablo was too great. The sound waves from the fog whistle at Lime Point, however, should have been heard, and as the moderate southwest wind would tend to cause a deflection of the sound wave upward it is possible that while the sound was inaudible on the deck of the vessel it might have been heard by a lookout at the masthead.



It has occurred to the writer, although the suggestion may prove of no value in practice, that if a strong sound had been made under water by some automatic contrivance at either Lime Point or Point Diablo, and the *Rio de Janeiro* been provided with some suitable device rendering audible the sound wave through the water, the strong cross current would have facilitated the passage of the sound and a zone of audibility would have been established in the water, while in the atmosphere above the fog signals would have been inaudible.



The accompanying photographs, Plate VI, are submitted to show that to a certain degree the captain and the pilot were justified in assuming that they might soon run into areas free from fog. As a matter of fact on the day in question the fog soon disappeared and a delay of perhaps two hours would have prevented the accident. It should not be forgotten, however, that the captain was unwilling to enter the harbor during the fog Thursday night, and that the vessel remained at anchor for a period of nearly twelve hours and was thereby exposed in a large degree to the danger of collision.



## THUNDERSTORMS.

It is sometimes stated that thunderstorms are exceedingly rare in California and that lightning is almost unknown along the coast. And it is generally believed that the Pacific coast, or at least the southern half of it, is a region free from thunderstorms and the damage by lightning is practically an unknown quantity. In the eastern part of the United States considerable damage is done by thunderstorms between the months of April and September. In California thunderstorms may occur during any part of the year. In a discussion of 356 reports of thunderstorms in California from July, 1895, to August, 1896, we found that there were 3 dates in July on which storms occurred, 6 in August, 8 in September, 10 in October, none in November, 3 in December, 5 in January, 2 in February, 3 in March, 9 in April, 15 in May, 6 in June, 22 in July, and 17 in August.

Some of the storms covered very large areas and were quite generally reported, such, for example, as October 14-15, 1895; May 29 and August 28-29, 1896. Examining certain marine reports, it appears that on January 25, 1896, thunderstorms prevailed in the Pacific Ocean, and it is not surprising to find that a day or two later thunderstorms were reported in California. These storms apparently moved inland from the ocean. There is another class of storms, however, apparently connected with the general low-pressure movements from the southwest. A condition favorable for thunderstorms in the valley of the Colorado in July and August is frequently followed within ten or twenty hours by thunderstorms along the Sierra.

The following table shows the distribution of thunderstorms in California during the year of 1895-96:

DISTRIBUTION OF THUNDERSTORMS.

Station.	County.	Eleva- tion.	1895.					1896.						
			July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.
		<i>Feet.</i>												
Bodie.....	Mono.....	8,248	16-21	12	20								22-23	22-23-24
Briggs.....	Yolo.....	51				14-15	15							
Centerville.....	Alameda.....	87			8	14-15								
Grafton.....	San Bernardino	1,759							29					
Crescent City.....	Del Norte.....	50					14	21	29		9	29		
Durham.....	Butte.....	180					15					29		
Descanso.....	San Diego.....	3,400						29						13
Edmonton.....	Plumas.....	4,750		28	17-18	15-16 19-20-21		17-26					28	
Evergreen.....	Santa Clara.....	150											6	
Follow's Camp.....	Los Angeles.....	800									10	6		
Fort Bragg.....	Mendocino.....	74					20	18-26						
Folsom City.....	Sacramento.....	182				20				27	24	6-21		
Grass Valley.....	Nevada.....	2,090						29	29		9-24	29		
Greenville.....	Plumas.....	3,600		28	17-28	15-20		29						
Guinda.....	Yolo.....	350			13	14-15		28					28	
Georgetown.....	Eldorado.....	2,750								26				
Iowa Hill.....	Placer.....	2,825		27	18	19		17-29		28	24			
Laporte.....	Plumas.....	5,000			18	19		17			18	28	25	
Lagrange.....	Stanislaus.....	293			18									
Lick Observatory.....	Santa Clara.....	4,209				14-15						6		
Lime Kiln.....	Tulare.....	600				18-19			29	25-26-27				

DISTRIBUTION OF THUNDERSTORMS—Continued

Station	County	Eleva- tion	1895						1896					
			July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
		<i>Feet</i>												
Lodi . . . . .	San Joaquin.	32	-	-	-	-	-	-	-	29	27	26	7	-
Los Angeles . .	Los Angeles .	293	-	-	-	-	-	-	-	-	-	-	28	-
Los Gatos . . .	Santa Clara	600	-	-	-	-	-	-	-	-	-	-	8	-
McMullen . . .	Fresno . . .	229	-	-	-	-	15	-	-	18	26	-	22-23	-
Middletown . .	Lake . . . .	1,800	-	-	-	-	-	-	-	-	-	-	-	-
Milton . . . . .	Calaveras	650	-	-	-	-	-	-	-	29	-	-	-	-
Mokelumne Hill	.do.	1,550	-	-	-	-	-	-	-	-	-	-	28-29	-
Mount Glenwood	Santa Cruz .	950	-	-	-	-	15	-	-	-	-	-	-	-
Napa . . . . .	Napa . . . .	95	-	-	-	18-15-16	-	-	-	-	-	15	-	-
Newcastle . . .	Placer . . . .	956	-	-	-	-	-	-	-	-	-	24	-	-
Niles . . . . .	Alameda	87	-	-	-	-	-	-	26	-	-	15	-	-
North Bloomfield	Nevada . . .	3,000	-	-	18	-	-	-	-	-	-	-	-	-
Oleta . . . . .	Amador . . .	1,510	-	-	-	12-12-19-20	-	-	29	-	26	24	28	-
Orangevale . . .	Sacramento	300	-	-	-	-	-	-	-	29	27	9	-	-
Ontario . . . .	San Bernardino	1,750	-	-	-	-	-	-	-	-	-	-	-	-
Pasadena . . . .	Los Angeles	875	-	-	26-27	-	-	-	-	-	-	-	6	-
Paso Robles . . .	San Luis Obispo	880	-	-	-	-	-	-	-	-	-	-	6-20	-
Peachland . . .	Sonoma . . .	200	-	-	-	-	-	-	26	-	-	-	-	-
Pichaco . . . .	San Diego	220	-	-	-	-	-	-	28	-	-	-	7-29	-
Pilot Creek . .	Plumas . . .	4,000	-	-	-	-	-	-	-	-	-	-	-	-
Placerville . . .	Eldorado . .	1,820	-	-	-	15-16-17	-	-	29	29	26-27	16-21	28-29	-
Quincy . . . . .	Plumas . . .	3,350	-	26	-	-	-	-	17-21	-	-	-	-	-
Reedley . . . .	Fresno . . .	347	-	-	-	-	-	-	-	-	-	-	6	-
Rio Vista . . .	Solano . . .	11	-	-	-	-	-	-	-	-	-	-	6	-
Roseville . . . .	Placer . . . .	162	-	-	-	-	-	-	-	-	-	16-24	8-9-18	-
Rosewood . . . .	Tehama . . .	865	-	-	-	17-20	-	-	-	29	-	18-19	5-9-18-28	1-26
Sacramento . . .	Sacramento	35	-	-	-	-	15	-	-	-	-	-	28	-
San Francisco . .	San Francisco .	155	-	-	-	-	15	-	26	-	-	16-24	29	-
San Jose . . . .	Santa Clara	95	-	-	-	-	14	-	-	-	-	-	29	-
San Miguel Island	Santa Barbara .	500	-	-	-	-	19	-	-	-	-	-	-	-
San Leandro . . .	Alameda . . .	48	-	-	-	-	15	-	26	-	-	-	29	-
Santa Clara . . .	Santa Clara . .	83	-	-	-	-	14	-	-	-	-	-	-	-
Santa Cruz . . .	Santa Cruz . .	25	-	-	-	-	-	-	-	29	-	-	-	-
Shasta . . . . .	Shasta . . . .	1,148	-	19	-	17-20	-	-	28	-	26-27	18-21-29	2-3-23-28-29	-
Snedden's Ranch .	Ventura . . .	4,900	-	-	-	-	-	-	27	-	-	10	-	-
Summerdale . . .	Mariposa . . .	5,270	-	-	-	-	-	-	-	-	-	24	-	-
Susanville . . .	Lassen . . . .	4,195	-	-	17	-	-	-	-	-	-	-	8-29	-
Turlock . . . .	Stanislaus . .	106	-	-	-	-	-	-	-	-	-	-	-	-
Ukiah . . . . .	Mendocino . .	620	-	-	17	-	-	20	-	-	-	-	6-29	-
Upper Soda Lake .	Lake . . . . .	1,800	-	-	-	-	-	-	-	-	-	-	28-29	-
Ventura . . . .	Ventura . . .	50	-	-	-	-	-	-	27	-	-	-	-	-
Washington . . .	Nevada . . . .	2,140	-	-	-	-	-	-	-	-	-	29	-	-
Westpoint . . . .	Calaveras . .	2,326	-	-	-	-	-	-	-	-	-	29	-	-
Wire Bridge . . .	Placer . . . .	565	-	-	-	-	-	-	-	-	-	24	-	-
Yreka . . . . .	Siskiyou . . .	2,635	3	28-29	-	-	-	-	-	-	-	-	23-29-31	1-2-30

During the summer months in the great valleys and canyons of the eastern and southern portions of the State thunderstorms frequently occur during the afternoon and evening hours.

John Muir, writing in the Atlantic Monthly for September, 1901, on the Big Trees, makes the following statement. "Most of the Sierra trees die of disease. Thus the magnificent silver firs are devoured by fungi, and comparatively few of them live to see their three hundredth birth year. But nothing hurts the Big Tree. I never saw one that was sick or showed the slightest sign of decay. It lives on through indefinite thousands of years, until burned, blown down, undermined, or shattered by some tremendous lightning stroke. No ordinary bolt ever seriously hurts Sequoia. In all my walks I have seen only one that was thus killed outright.

"Lightning, though rare in California lowlands, is common on the Sierra. Almost every day in June and July small thunderstorms refresh the main forest belt. Clouds like snowy mountains of marvelous beauty grow rapidly in the calm sky about midday and cast cooling shadows

and showers that seldom last more than an hour. Nevertheless, these brief, kind storms wound or kill a good many trees. I have seen silver firs 200 feet high split into long peeled rails and slivers down to the roots, leaving not even a stump, the rails radiating like the spokes of a wheel from a hole in the ground where the tree stood. But the Sequoia, instead of being split and slivered, usually has 40 or 50 feet of its brash, knotty top smashed off in short chunks about the size of cord wood, the beautiful rosy-red ruins covering the ground in a circle 100 feet wide or more.

"I never saw any that had been cut down to the ground, or even to below the branches, except one in the Stanislaus Grove, about 12 feet in diameter, the greater part of which was smashed to fragments, leaving only a leafless stump about 75 feet high. It is a curious fact that all the very old Sequoia have lost their heads by lightning. • 'All things come to him who waits,' but of all living things Sequoia is perhaps the only one able to wait long enough to make sure of being struck by lightning. Thousands of years it stands ready and waiting, offering its head to every passing cloud as if inviting its fate, praying for heaven's fire as a blessing, and when at last the old head is off another of the same shape immediately begins to grow on."

During the months of July and August, 1896, thunderstorms were unusually frequent. During July storms occurred at Bodie on the 4th, 5th, 21st, 23d, and 25th; at Crafton on the 4th; at Descanso on the 8th, 10th, 12th, 13th, and 24th; at Edmanton on the 5th, 15th, and 16th; at Greenville on the 5th, 16th, 24th, and 25th; at Guinda on the 5th; at Laporte on the 5th and 15th; at Lodi on the 25th; McMullen on the 3d, 4th, 7th, 12th, 17th, and 24th; at Middletown, 29th; Paso Robles, 4th; Peachland, 10th; Pichaco, 9th, 12th, 13th, 14th, 15th, 18th, and 24th; Pilot Creek, 5th, 15th, 16th, 25th, and 26th; Placerville, 25th; Quincy, 15th; Reedley, 4th, 5th, 22d, and 24th; Rio Vista, 10th; Rosewood, 5th, 15th, 25th, 27th, and 28th; Santa Cruz, 22d; Shasta, 17th, 26th, 27th, and 28th; Turlock, 4th and 25th; Ukiah, 10th and 29th; Upper Silver Lake, 10th, 27th, 28th, and 29th; Washington, 15th; West Point, 25th; Wire Bridge, Yreka, 25th, 26th, 27th, and 28th.

*August, 1896.*—Bodie, 12th, 17th, 18th, 19th, and 22d; Crafton, 16th; Crescent City, 29th; Durham, 30th; Descanso, 14th, 15th, and 27th; Edmanton, 22d, 28th, and 30th; Follows Camp, 16th; Folsom, 22d and 30th; Grass Valley, 22d and 30th; Greenville, 22d, 23d, 24th, 28th, and 29th; Iowa Hill, 29th; Laporte, 22d, 28th, and 29th; Los Gatos, 19th; McMullen, 20th and 29th; Middletown, 29th and 30th; Newcastle, 18th and 22d; Niles, 19th; North Bloomfield, 22d; Orangevale, 22d; Peachland, 19th and 20th; Pichaco, 14th, 19th, 26th, 27th, and 28th; Pilot Creek, 17th, 22d, and 29th; Placerville, 22d; Roseville, 21st; Rosewood, 19th, 20th, 23d, 28th, 29th, and 30th; Sacramento, 22d; San Jose, 19th; Santa Clara, 20th; Santa Cruz, 18th; Shasta, 20th and 27th; Susanville, 19th and 23d; Ukiah, 22d; Ventura, 17th; Wire Bridge, 22d; Yreka, 19th, 20th, and 21st.

*September, 1896.*—Edmanton (distant) on the 20th and 28th; at Grass Valley on the 28th; at Iowa Hill on the 28th; at Los Gatos on the 21st; at Lime Kiln on the 5th; at Laporte on the 2d, 3d, 6th, 20th, 22d, and 28th; at Upper Lake (Ma. Tel. Vineyard) on the 22d; at McMullen on the 20th; at North San Juan on the 28th; at Pilot Creek on the 5th and 28th; at Rio Vista on the 22d; at Reedley on the 5th; at Rosewood on the 22d; at San Jacinto on the 4th, 5th, and 29th; at Shasta on the 7th; at Snedden on the 5th; at Tulare on the 5th, 19th, and 22d; at Turlock (distant) on the 5th; at Yreka on the 6th, and 22d; at Isabella on the 5th.

*October, 1896.*—On the 20th, at Bodie; on the 25th, at Briggs Vineyard; on the 27th, at Descanso; on the 16th, at Famosa; on the 25th, at Guinda; on the 27th, at Las Fuentes Rancho; on the 25th, at Peachland; on the 16th, at Paso Robles; on the 27th, at Claremont; on the 16th, at Reedley; on the 25th, at Sacramento; on the 25th, at Ukiah; on the 25th, at Winters.

During November and December there were few, if any, thunderstorms in California.

The following notes relative to the character of the storms may be of interest:

On January 26, 1896, the plant of the Haywoods Electric Light Company was struck by lightning. The electrician, Mr. J. Putnam, is reported as saying:

I was not more than 20 feet away from the dynamo when the crash came, and it seemed as if the lightning filled the whole building. The flames shot out from the dynamo about 8 feet, and the wires, magnets, and mica were thrown all over the place. I instantly ran to the switchboard and disconnected the wires, and there was no more

light that night. The accident was a very simple one, and one that will be guarded against in future. The lightning was conducted to the machine by one of the wires, and of course the dynamo was instantly overcharged and burnt \* \* \* There is one hole and no trace of the missing metal. The wires that surrounded the magnets were so highly charged that they flew in all directions, and when the mica was free it fell around in showers. It will take several days to fix the wrecked machine. If I had been oiling that dynamo when the lightning struck I would have been charred to a cinder as rapidly as that piece of iron was burned.

At Folsom, on the 24th of April, lightning struck the lines of the Electric Light and Power Company five times, and the machines went out of step at each stroke. The lightning arresters were burned and discolored. On April 9, at Ontario, two strokes of lightning entered the electric power house. Wires were burned and a coat belonging to one of the employees set on fire.

The first stroke, it is stated, came from overhead, while the second struck the wires miles away and came in when the sky was clear overhead. Lightning conductors were under the floor, but had not been connected, as it was thought there would be no use for them. After the first stroke they were connected. Notwithstanding, the second stroke did more damage in the power house than the former, showing that it was much the heavier charge.

The Fresno Republican of October 17 reports that—

A heavy thunderstorm in the hills caused a shutting down last evening of the entire electric plant of the San Joaquin Electric Company for twenty minutes. The lightning passing over the lightning arresters caused the points to become welded together, forming a short circuit across the two lines. Occurring at a time when the city was in darkness the delay in repairing was greater than it would have been during the day. No great damage was done to the machinery.

In the city of San Francisco houses and barns have been struck and some damage done. A large cypress tree on the southeast corner of Broderick and Green streets was riven from branch to root. A very large branch was torn off and thrown some little distance. On August 19, 1896, the signal-flag pole at Point Lobos was struck by lightning and badly damaged. The pole was 60 feet high, and the upper 20 feet were so torn that a new pole was necessary. Large splinters of wood were thrown over 150 feet away. Lights were burned out at the terminus of the Sutro Electric Railroad, and other damage done in the vicinity.

On November 7, 1900, four distinct flashes of lightning, accompanied by loud thunder, were recorded at the Weather Bureau office at San Francisco. The first flash was at 10.15 a. m. and the others at 10.27, 10.30, and 10.42 a. m. The average interval between the flash and the thunder was about six seconds. On December 14, 1900, during a sharp thunderstorm a flash of lightning struck the relief gasometer at Bay and Buchanan streets, containing 260,000 cubic feet of gas. The tank was demolished and the gas ignited. The flame was carried by the gale a distance of 250 feet, and the roar could be heard above the noise of the storm. The officials of the gas company estimated the loss at \$6,000.

On October 3, 1901, at Houghton ranch, near Thomas Creek, about 12 miles west of Corning, Cal., during a heavy thunderstorm Coutea Jobe, aged 20 years, was struck by a flash of lightning and killed.

The light-house on the Southeast Farallon Island was once struck and a small amount of damage resulted.

*January, 1898.*—At Hill Ranch on the 31st.

*February, 1898.*—At Fort Bragg on the 20th, Grass Valley 7th, Iowa Hill 27th, Lodi 7th, Rosewood 7th, 20th, and 27th, Sacramento 7th, Shasta 24th and 27th, Wire Bridge 7th and 27th.

*March, 1898.*—At Folsom and Grass Valley on the 9th, Hill Ranch 25th, Iowa Hill 9th and 17th, Limekiln, Oleta, Placerville, and Pilot Creek 9th, Rosewood 16th, West Point 9th, Wire Bridge 9th and 26th.

*April, 1898.*—At Bowmans Dam 29th and 30th, Descanso 14th, Durham 30th, Edmanton 29th, Elsinore 14th, Folsom 30th, Grass Valley 29th, Laporte 29th and 30th, North Hill vineyard 6th, Oleta and Pilot Creek 30th, Quincy 29th, Shasta 27th, Susanville and West Point 30th, Yreka 29th and 22d.

*May, 1898.*—At Bodie on the 11th and 12th, Cedarville 5th, 11th, and 13th, Grass Valley 19th, Rosewood 12th, 17th, and 18th, Shasta 17th and 18th, Susanville 14th, Yreka 5th, 11th, 12th, and 13th.

*June, 1898.*—At Bodie on the 6th, Bowmans Dam 7th and 8th, Cedarville 7th, 11th, and 22d, Edmanton 8th and 9th, Manzanita 10th, Rosewood 1st, 7th, 8th, 9th, 10th, and 11th, Shasta 1st and 8th, Ukiah th.

*July, 1898.*—At Bodie on the 6th and 29th, Descanso 10th, Edmanton 8th, Los Angeles 4th, San Jacinto 3d and 4th, West Saticoy 4th, Yreka 8th and 21st.

*August, 1898.*—At Bodie on the 6th, 12th, and 13th, Cedarville 8th and 13th, Crescent City 28th, Descanso 10th, 15th, 20th, 21st, 22d, 24th, and 28th, Edmanton 28th, Elsinore 9th, 10th, 12th, and 20th, Fallbrook 9th, Greenville 6th and 7th, Laporte 6th, Oleta 7th, Quincy 29th, Rosewood 6th, 13th, 14th, and 31st, San Jacinto 9th and 21st, Shasta 28th, Sierra Madre 9th, Susanville 13th and 29th, Ukiah and Upper Lake 13th, Yreka 6th, 7th, 14th, 28th, and 31st.

*September, 1898.*—At Anada on the 1st, Descanso 8th, Georgetown, Grand Island, Oleta, and Pilot Creek 26th, Rosewood 1st, Susanville 30th, Turlock 26th, Yreka 1st.

*October, 1898.*—At Crescent City on the 1st, Durham 3d, Grand Island 3d and 7th, Greenville 7th and 8th, Lodi 2d and 8th, Oakland and Peachland 7th, Rosewood 3d, Turlock 1st and 8th, Wire Bridge 2d.

*November, 1898.*—At Crescent City, Del Norte County, on the 19th.

*December, 1898.*—At Escondido on the 9th, Fallbrook 8th and 9th, Long Beach 14th, Poway 9th.

*January, 1899.*—At Fallbrook, Irvine, Paso Robles, Ranch House, Santa Barbara, and West Saticoy on the 11th, Oleta on the 20th.

*February, 1899.*—At Berkeley on the 1st and Mills College on the 2d.

*March, 1899.*—At Goldrun on the 12th, Grass Valley 13th, Iowa Hill 12th, Kennedy Gold Mine 28th, Lodi 16th, Oleta 26th, Pilot Creek 12th and 28th, Rosewood and Shasta 24th and 28th, Wire Bridge 13th and 18th, Yreka 28th.

*April, 1899.*—At Grand Island on the 25th, Greenville 21st, Guadalupe 26th, Laporte 21st, Napa 24th, North Bloomfield 27th, North San Juan 24th, 25th, and 30th, Oleta 23d, Pilot Creek and Raymond 30th, Rosewood 1st and 24th, Thermalito 24th and 30th.

*May, 1899.*—At Bodie on the 5th, Bowmans Dam 4th and 18th, Cisco 12th and 18th, Cuyamaca 8th, Delta 5th, Floriston 18th, Folsom 14th, Goldrun 6th, Grand Island 5th and 24th, Greenville 5th and 14th, Iowa Hill 18th and 24th, Lodi 6th, Moreno Dam 8th, North Bloomfield 5th and 14th, North San Juan 6th, Oleta 24th, Placerville 24th, Sacramento 14th, Tehama, Thermalito, and Wheatland 5th, Yreka 24th.

*June, 1899.*—At Folsom, Pilot Creek, and Wire Bridge on the 2d, Susanville on the 1st.

*July, 1899.*—At Cedarville on the 14th, Cuyamaca and Volcano Springs 20th and 21st, Yreka 14th and 15th.

*August, 1899.*—The central and northern portions of the State experienced unusual electrical storms during the first part of the month, that of the 3d being the most severe in the month of August for many years; it was accompanied by rain at some places and by heavy hailstorms at others, but no extensive damage was reported. In the San Joaquin Valley, where the storm was most severe, telegraph and telephone lines were interfered with, fuses were burned out and a few poles were struck by lightning, and at North Hill vineyard two horses were instantly killed. During the storm of the 6th, in the vicinity of Chico six persons were stunned by lightning while riding in a wagon and a young colt was killed. On the 10th, at Susanville, Lassen County, several sheep were killed by lightning. The following stations report thunderstorms on the 3d: Auburn, Bodie, also on the 1st, 2d, 4th and 7th; Elkgrove, Folsom, also on the 4th; Goldrun, Grand Island, Guinda, Iowa Hill, also 2d, 4th, 5th, 6th; Lagrange, Lankershim, Lathrop, Lick Observatory, Lodi, Merced, Milton, Minturn, Napa, North Bloomfield, North Hill vineyard, North San Juan, also 4th and 6th; Palermo, also 5th and 6th; Pilot Creek, also 4th, 5th, 6th; Raymond, Rivista, Sacramento, Shasta, also 16th; Stockton, Upper Lake, Vacaville, Wheatland, Wire Bridge, Woodland. Other thunderstorms were reported as follows: At Boulder Creek on the 4th and 5th, Chico 6th, Covelo 20th, Edmanton 17th, Fort Ross and Grass Valley 4th, Greenville 4th and 6th, Healdsburg 2d, Kono Tayee 1st, Laporte 4th, 6th, 17th, Los Angeles 9th, Oleta 6th, 7th, Orange 9th, Quincy 6th, Rosewood 6th, 7th, Santa Ana 9th, Susanville 4th, 5th, 6th, 10th, 17th, Yreka 13th, 19th.

*September, 1899.*—At Arcadia, Buena Park, Compton, Downey, Irvine, North Ontario, Palm Springs, Ranch House, and Sierra Madre on the 9th. There were also thunderstorms in the mountains near Bakersfield, Downey, Huon, and Tejon Rancho on the 11th.

*October, 1899.*—At Arcadia on the 7th, Crescent City 19th, Cuyamaca and Lamesa 6th, Lodi 11th and 12th, North Bloomfield 12th, North Hill vineyard 11th, North Ontario 6th, Oleta 11th and 12th, Pilot Creek 11th, 12th, and 20th, Ranch House 6th, Reedley 13th, Represa 11th, Rosewood 12th, 21st, and 22d, Shasta 19th and 22d, Stockton 1st, Summit 10th and 11th, Wire Bridge 11th and 12th.

*November, 1899.*—At Crescent City on the 21st, Fall Brook 17th, Lamesa 14th, Oleta 12th and 15th, Placerville 15th, Rosewood 10th

*December, 1899.*—At Berkeley and Fort Ross on the 8th and Crescent City on the 14th, 30th, and 31st.

*January, 1900.*—At Crescent City on the 7th.

*February, 1900.*—At Porterville, Rosewood, Santa Maria, and Yreka on the 18th.

*March, 1900.*—At Bellevue on the 3d, Claremont and Follows Camp 20th, Crescent City 26th, Delta 2d, Edmanton 22d and 25th, Folsom, Grass Valley, Greenville, Laporte, Mokelumne Hill, North Hill vineyard, Oleta, Porterville, Westpoint, and Wire Bridge 22d, Lagrange, Raymond, Redding, Represa, Rosewood, Thermalito, and Wheatland 4th, Moreno Dam 14th, North San Juan 7th, Pilot Creek 21st, Susanville 30th.

*April, 1900.*—At Bellevue, Bodie, Shasta, Susanville, and Yreka 30th, Bowmans Dam 15th, Branscomb, Durham, Edmanton, Grass Valley, Iowa Hill, Johnsville, Lagrange, Lankershim, Laporte, Le Grand, Lodi, Merced, Nevada City, Palermo, Redding, Rosewood, Vina, Visalia, and Wire Bridge 2d, Elsinore 28th, Greenville 25th, 28th, and 30th, Irvine 3d and 27th, Moreno Dam 27th, Oleta 23d, Pilot Creek 2d and 28th, Raymond 3d.

*May, 1900.*—At Bellevue on the 31st, Crescent City, Edmanton, Greenville, Laporte, and Pilot Creek 2d, Folsom, Irvine, Represa, Sacramento, Shasta, Tracy, and Wire Bridge 4th, Rosewood 9th and 10th, Susanville 3d

*June, 1900.*—At Antioch, Brentwood, Campbell, Dunville, Jackson, Laporte, Lick Observatory, Lodi, Los Gatos, Milton, Mokelumne Hill, North Hill vineyard, Oleta, Riovista, San Luis Obispo, San Ramon, and Wire Bridge on the 13th, Auburn, Georgetown, and Iowa Hill on the 12th, Cedarville 11th, Cottonwood, Red Bluff, and Shasta 15th, Edmanton 9th, Greenville 9th and 15th, Paso Robles 8th, Pilot Creek 12th to 15th, Rosewood 8th, 13th, and 15th, Susanville 8th and 9th, Tejon Rancho 8th, Yreka 2d, 11th, 15th, 17th, and 22d.

*July, 1900.*—At Bodie on the 31st, Bowmans Dam 21st, Cedarville 20th, 21st, and 29th, Elsinore 20th, Greenville 2d, 21st, and 22d, Laporte and North San Juan 21st, Palm Springs 20th and 31st, Pilot Creek 21st, 22d, and 23d, Rosewood 1st, Summit 20th and 24th, Susanville 2d, 20th, 21st, and 29th, Yreka 20th and 29th.

*August, 1900.*—At Bellevue on the 7th, 14th, 18th, 20th, 22d, and 28th, Bodie 1st, Cedarville 10th, 14th, and 20th, Edmanton 30th, Elsinore and Fall Brook 1st, La Porte 29th, Mammoth Tank 1st, Manzana 31st, Moreno Dam 1st, Oleta 30th, Placerville 30th, Redding 20th, Rosewood 7th and 28th, Shasta 24th, Susanville 19th, Yreka 14th and 21st.

*September, 1900.*—At Branscomb on the 7th, 11th, and 13th, Cedarville 7th and 10th, Cuyamaca 2d, Folsom and Grand Island 12th, Greenville 3d, 10th, 11th, and 12th, Jackson 12th, Lodi 13th, North Bloomfield 11th, 12th, and 13th, North Hill Vineyard 12th, Pilot Creek and Placerville 13th, Redding 4th, 5th, 12th, and 13th, Rosewood 4th, 7th, 11th, and 12th, Sacramento 12th, Santa Barbara 1st, Shasta 4th, Summit 12th, Susanville 3d, Tejon Ranch 1st and 2d, Visalia 2d and 3d, West Point 3d and 12th, Wire Bridge 12th, Yreka 7th, 10th, and 12th.

*October, 1900.*—At Branscomb on the 3d, Crescent City 18th and 23d, Grand Island 28th, Iowa Hill 2d, Keeler, La Porte, and Moreno Dam 11th, Pilot Creek 2d, 11th, and 28th, Redding 11th, Summit 4th, Wheatland 18th, West Point 2d.

*November, 1900.*—At Berkeley on the 7th and 16th, Branscomb 20th, Claremont and Cuyamaca 17th, Grand Island, Grass Valley, and Los Gatos 7th, Los Angeles 16th, Mills College 7th and 16th, Niles 7th, North Ontario 17th, Oakland and San Francisco 7th and 16th, Oleta 19th, Rio Vista 21st, Rosewood 7th, Sacramento 21st, San Bernardino and Soledad 17th.



*December, 1900.*—The following stations reported severe storms, accompanied by thunder, lightning, high wind, and rain, on the 14th: Berkeley, Campbell, Fort Ross, Grand Island, Jackson, Lick Observatory, Merced, Mills College, Modesto, Oakland, Oleta, Peachland, Pilot Creek, Rio Vista, San Francisco, San Leandro, Sonoma, Suisun, Vacaville, West Point, and Wire Bridge; also at Crescent City and Tequisquita Rancho on the 16th, and Le Grand on the 17th.

## LOCAL STORMS.

With nearly every general disturbance there are reports of individual disturbances with more or less damage in limited areas. As a rule the State of California is exempt from marked tornadic disturbances. Severe local storms, however, sometimes occur, but, as stated above, these are chiefly straight-line wind storms. The following illustration, however, seems to show more of the violent gyratory action of the whirlwind than of an ordinary storm, and is therefore given.

## STORM OF DECEMBER 14, 1900.

By J. C. STANTON, voluntary observer.

The storm of December 14 in the vicinity of Rio Vista somewhat resembled a tornado, accompanied by thunder and lightning. The first manifestation seems to have been at Lodi, about 10 miles to the southeast, where considerable damage was done. It then took somewhat of a southwesterly course to Collinsville, where a hay barn was taken up bodily, carried several hundred feet, dropped, and entirely demolished. The building must have been raised perpendicularly, as a large quantity of baled hay which it contained remained intact and unmolested. From this point the storm took a northeasterly course, arriving at Rio Vista about 10.45 a. m., sweeping through the northwest part of the town, unroofing a carpenter shop, blowing down a high board fence, and overturning two windmills at St. Gertrude's Academy. These were strongly constructed, with iron towers, and from their appearance seem to have been twisted off and so badly damaged as to be entirely worthless. About 300 yards from this point the storm demolished another iron windmill, and picked up a heavy handcart, carrying it 600 feet, dropping and breaking it to pieces. By this time the wind was blowing from the west. Half a mile farther on another barn was demolished by being carried a short distance and dropped. From this point the storm traveled easterly, and at a distance of less than a mile unroofed a large warehouse on the bank of the Sacramento River. It then crossed the river in a southeasterly direction, doing some damage. During the storm, which lasted but a few minutes, the wind blew from all points of the compass, commencing from the southeast and returning to the same.

## SAND STORMS.

Sand storms and dust storms occur quite frequently in many portions of the State. Particularly on the southeastern slope of the Sierra and in some of the valleys of southern California do these storms occur. The presence of an area of high pressure over Nevada and Utah, causing strong northerly winds, is probably the prime factor in the formation of these dust storms. As might be expected, the air is highly electrified at such times. Like the "northers" of the great valleys these dust-laden winds are very trying upon people and injurious to stock and crops. Many illustrations could be given, but the following will probably suffice:

## SAND STORM IN SAN LUIS OBISPO COUNTY.

The following report of a remarkable sand storm near Creston, San Luis Obispo County, is furnished by John G. W. and Wilhelmina A. Schulte. The severity of this storm was also noted by many other observers in their monthly reports for June:

"On June 30, 1898, there was an unusually heavy sand storm from 10 a. m. to 8 p. m. The early morning had the appearance of light fog, although no moisture was felt, and it was soon realized that a sand storm was approaching. The clouds of fine dust became so dense that large oak trees 50 yards away could be but indistinctly seen. The air was very still and sultry. The little sunlight visible at times through the dust was white in appearance and much resembled moonlight. In a little while all things had a gray or yellowish coating. Animals seemed affected and were quiet. Not a sound was to be heard; not even the chirping of birds. There was an unpleasant odor with the dust, which resembled buhach.

"This was said to be the severest storm known in the middle section of San Luis Obispo County. It appeared at Paso Robles, in the northern part of the county, about 8 a. m., but was not felt at Creston, 16 miles southeast, until 9.30 a. m. In Creston there was a slight northerly breeze. Maximum temperature, 91°; minimum, 46°; temperature at noon, 86°."



## EARTHQUAKES.

It may be open to question whether the subject of earthquakes should properly be included in a memoir upon climatology. The subject belongs rather to geology. In the absence, however, of any systematic record of seismic phenomena in the State of California, a brief record of the quakes has been kept by the Weather Bureau. There is a well-defined belief among the older residents of California that earthquakes are preceded by a spell of sultry weather, and this is even known by the name of "earthquake weather." There is, however, no known relation between earthquakes and the weather. As shown by the following table, some of the most severe earthquakes have occurred when the conditions of weather were in nowise those which are said to be characteristic. The true causes of earthquakes must be sought elsewhere than in meteorological conditions.

*January, 1897.*—At Niles on the 29th, San Leandro 17th and 23d.

*February, 1897.*—At Descanso on the 16th and 25th.

*May, 1897.*—At Crescent City on the 15th, 23d, and 29th, Edmanton 15th.

*June, 1897.*—On the 20th at Campbell, Centerville, Hollister, North Hill Vineyard, Rio Vista, Sacramento, San Francisco, San Jose, San Leandro, Santa Cruz, and Stockton.

*July, 1897.*—At Castle Pinckney on the 18th.

*August, 1897.*—At Ukiah on the 19th.

*September, 1897.*—At Descanso on the 6th and 22d, Hollister 2d.

*October, 1897.*—At Campbell on the 2d and 17th, Descanso 27th, Niles 2d, San Francisco and San Jose 17th.

*November, 1897.*—At Descanso on the 12th and 22d, Escondido and Fall Brook 22d.

*December, 1897.*—At Niles on the 26th.

*1898.*—The only severe shock experienced was on the 30th of March, when considerable damage resulted at San Francisco, Vallejo, and other points in the central and northern portions; and at Centerville, Alameda County, it was reported the most severe since October 21, 1868.

*January, 1898.*—At Peachland, Sonoma County, at 5.15 a. m. on the 1st.

*February, 1898.*—At Bishop, Inyo County, a light shock on the 6th, and five distinct shocks between 3.30 and 5.30 a. m. on the 15th.

*March, 1898.*—At Descanso on the 3d, Upper Lake 17th; and the following stations reported unusually severe shocks on the 30th, at about 11.42 p. m.: Agnews, Berkeley, Campbell, Fort Ross, Georgetown, Hollister, Iowa Hill, Lytton Springs, Napa, Niles, North San Juan, Oakland, Oleta, Peachland, Rio Vista, Sacramento, San Francisco, San Leandro, Santa Cruz, Stockton, Upper Lake, Vacaville, Vallejo, and West Point.

*April, 1898.*—At Claremont on the 30th, Descanso 21st; Fort Bragg, Mills College, Oakland, Peachland 14th, Pomona 30th, Upper Lake 14th and 15th.

*May, 1898.*—At Cedarville on the 17th and 19th, Hollister 28th. There were frequent shocks during the month at Fort Bragg.

*June, 1898.*—At Descanso on the 23d and 24th, Ukiah 8th, 9th, and 11th, Upper Lake 9th.

*August, 1898*—At Oakland on the 7th, San Leandro 28th and 31st

*October, 1898*.—At Bishop on the 13th, Descanso 30th, San Bernardino 23d, Ukiah 15th.

*November, 1898*.—At Centerville on the 14th, Summerdale 5th.

*December, 1898*—At Centerville and San Leandro on the 7th

*January, 1899*—Light shocks occurred at Napa and Sonoma on the 13th, and at San Bernardino on the 24th.

*March, 1899*.—Light shock at Ukiah on the 7th.

*April, 1899*.—Light shocks at Oakland on the 5th and 30th, Cuyamaca 14th, Hydesville 16th and 18th. On the 30th quite heavy shocks were reported at Alvarado, Campbell, Capitola, Coyote, Gilroy, Glenwood, Hollister, Los Gatos, Niles (Centerville), Pacific Grove, San Francisco, San Leandro, Santa Cruz, Soledad, Stanford University, and Stockton

*May, 1899*.—There was a light shock at Bishop on the 13th

*June, 1899*.—On the 1st, at 11 20 p. m., severe shocks occurred at San Francisco, Niles, Oakland, Stanford University, Capitola, Mills College, Napa, and Livermore. Lighter shocks were also reported, as follows: On the 1st at Campbell, Moreno Dam, Peachland, 3d, Oakland; 5th, Bradley; 11th, Keeler, Porterville, and Milo; 13th, San Francisco, San Jose, and Berkeley; 25th San Miguel.

*July, 1899*.—At 12.10 p. m. on the 6th light shocks occurred at Berkeley, Boulder Creek, Campbell, Capitola, Coyote, Elmwood, Gilroy, Glenwood, Gonzales, Hollister, Lathrop, Le Grand, Los Gatos, Merced, Milbrae, Modesto, Mount Eden, Napa, Niles, Oakland, Pacific Grove, Salinas, San Francisco, San Jose, Santa Cruz, and Stockton. Several severe shocks occurred in the southern portion of the State on the 21st and 22d, followed by lighter ones on the 23d, 28th, and 29th; reports were received from Anaheim, Arcadia, Colton, Duarte, El Cajon, Elsinore, Escondido, Fall Brook, Florence, Los Angeles, North Ontario, Pasadena, Pomona, Redlands, Riverside, San Bernardino, San Diego, San Dimas, San Pedro, Santa Ana, Spadra, and Ventura

*August, 1899*.—The following stations reported light shocks on the 4th and 5th: Ben Lomond, Boulder Creek, Campbell, Capitola, Glenwood, Lathrop, Los Gatos, Napa, Niles, Oakland, San Francisco, San Jose, Santa Cruz, and Tequisquita. There was also a slight shock at San Diego on the 21st

*September, 1899*.—There was a severe shock at San Miguel on the 16th; two light shocks at Needles on the 20th.

*October, 1899*.—Light shocks occurred at Cuyamaca, Peachland, and Santa Rosa on the 12th; Moreno Dam, 11th and 28th.

*November, 1899*.—There was a light shock at Napa on the 16th.

*December, 1899*—On the 25th sharp shocks were experienced throughout southern California; many observers reported the shocks the most severe ever known. Lighter shocks were also experienced frequently from the 25th to the 31st. Reports were received from the following stations: Arcadia, Banning, Claremont, Crafton, Cuyamaca, Duarte, El Cajon, Elsinore, Escondido, Fall Brook, Follows Camp, Girard, Hemet, Indio, La Mesa, Long Beach, Los Angeles, Monte, Moreno Dam, Needles, North Ontario, Norwalk, Ontario, Palm Springs, Pomona, Ravenna, Riverside, San Bernardino, San Diego, San Dimas, San Jacinto, Sierra Madre, Tehachapi, Tustin, and Whittier. Lighter shocks were reported at Chico on the 12th, 13th, 19th, 20th, and at Napa on the 25th.

*January, 1900*.—At Campbell, Niles, and San Leandro on the 14th, Los Gatos 6th, Moreno Dam 28th, Napa 5th, Palm Springs, "frequently during the first part of the month," Peachland 31st, San Jacinto 1st, 2d, 4th, 9th, 13th, 15th, and 27th.

*February, 1900*.—At Claremont on the 2d, Cuyamaca 13th, Petaluma 9th, San Jacinto 7th and 9th.

*March, 1900*—At Claremont on the 21st, Napa, Vacaville, and Vallejo 26th, Peachland 20th, San Jacinto 18th.

*April, 1900.*—At Cuyamaca on the 23d, Fall Brook 9th, Napa 16th, San Jacinto 15th and 16th.

*May, 1900.*—At Mount Eden on the 20th and San Jacinto on the 10th.

*June, 1900.*—At Cuyamaca on the 19th and 20th, Keeler 26th, San Ardo 9th.

*July, 1900.*—At Branscomb on the 12th and 13th, San Diego 23d, San Jose 28th.

*August, 1900.*—At Elsinore on the 18th, Ferndale 16th; Mills College, Niles, and Oakland 31st, San Jacinto 19th, San Jose, Stanford University and Tequisquita Rancho 31st.

*September, 1900.*—At Oakland on the 19th and Tequisquita Rancho on the 28th.

*October, 1900.*—There was a light shock at Tequisquita Rancho on the 24th.

*November, 1900.*—Light shocks occurred at Branscomb on the 8th, Cuyamaca 5th and 19th, Fallbrook 14th, Moreno Dam 19th, Napa 25th, Oakland 24th, Penn Grove 13th.

*December, 1900.*—There was a light shock at San Jose on the 30th.



# INDEX.

	Page.
CLIMATOLOGY OF CALIFORNIA.....	7
Controlling factors.....	7
Pressure distribution .....	7
Monthly precipitation at San Francisco (inches and hundredths) .....	9
Movement of areas of high pressure.....	12
Movement of areas of low pressure .....	12
Storms of the West Pacific Ocean .....	12
Typhoons of the Pacific Ocean.....	13
Low areas on the Pacific coast .....	14
Track of Pacific storm of November 20, 1895.....	14
Prevailing air drift and ocean effect.....	15
Topography.....	16
Table of elevations exceeding 1,000 meters (3,281 feet) in California.....	17
CLIMATE OF NORTH AND CENTRAL COAST.....	25
Climatology of Eureka, and weather conditions along the coast of northern California—	
Mean monthly and annual temperatures .....	25
Summary of monthly mean temperature.....	26
Weather .....	26
Rainfall at Eureka, from January 1, 1887, to December 31, 1898 (inches and hundredths) .....	26
Dates of first and last light and killing frosts, with lowest temperature at Eureka.....	28
Monthly precipitation, greatest and least and dates.....	28
Average hourly wind velocity at Eureka.....	28
Highest wind velocity, direction and date for each month at Eureka, from January 1, 1888.....	29
Average humidity (per cent) at Eureka.....	29
Number of foggy days and thunderstorms in fourteen years at Eureka .....	29
Total number of days on which precipitation has fallen at Eureka since January 1, 1887.....	29
Greatest precipitation in twenty-four hours for each month at Eureka .....	29
Annual meteorological summary of Eureka for the years 1899, 1900 .....	30
Sunshine at Eureka during the years 1898, 1899, and 1900 .....	32
Climate of San Francisco.....	33
Seasonal rainfall.....	35
Monthly mean temperatures.....	35
Monthly mean temperatures summary .....	36
Weather .....	36
Average temperature for each hour, seventy-fifth meridian time .....	36
Average pressure (inches and thousandths) for each hour of seventy-fifth meridian time.....	37
Sunshine for the years 1898, 1899, and 1900.....	38
Annual meteorological summary for the years 1899, 1900 .....	39
Some maximum and minimum temperatures .....	41
Notes from the record of G. H. Gibbons, M. D., 1847, 1848, 1849, 1850 .....	42
Total number of days on which precipitation has fallen from March 1, 1871, to March 1, 1901....	43
Number of high winds, September, 1881, to December 31, 1900 .....	43
Highest wind velocity, direction and date for each month to December 31, 1900 .....	43
Average velocity of afternoon winds.....	43
Greatest precipitation in twenty-four hours for each month.....	44
Greatest monthly precipitation and date .....	44
Least monthly precipitation and date .....	45
Number of times monthly precipitation has exceeded the normal for fifty years.....	45
Average hourly wind velocity (miles per hour).....	45
Monthly relative humidity (per cent).....	46
Dates of snowfall in San Francisco since March 1, 1871 .....	46
The great rainstorm of 1866 .....	46
Rainfall as measured by John Pettee January 1, 1865, to March 19, 1902.....	48

	Page
CLIMATE OF SOUTHERN COAST.....	59
San Luis Obispo—	
Rainfall (inches and hundredths) for the past twenty-eight years.....	59
Precipitation in inches and hundredths .....	60
Wind velocity and direction.....	60
Snowfall. The only snowfall at the station, one-half inch, occurred March 3, 1896.....	60
Mean monthly and annual temperature .....	60
Maximum and minimum temperatures.....	61
Weather .....	61
Annual Meteorological Summary for the years 1899 and 1900 .....	62
Santa Barbara.....	64
Climate.....	65
Precipitation (inches and hundredths) .....	66
Climate of Santa Barbara Foothills, Pine Crest Station.....	67
Los Angeles.....	68
Mean monthly and annual temperature .....	69
Maximum temperature.....	69
Minimum temperature.....	70
Mean daily range in temperature .....	70
Greatest and least daily range in temperature.....	71
Number of days temperature was above 90° F .....	71
Number of days temperature was below 32° F .....	72
Mean relative humidity .....	72
Highest and lowest mean relative humidity (per cent) .....	73
Total number of hours of actual sunshine.....	73
Total number of hours of possible sunshine.....	73
Percentage of sunshine .....	73
Number of clear, partly cloudy, and cloudy days.....	74
Number of days with frost.....	75
Number of days with thunderstorms .....	75
Number of days with 0.01 inch or more rainfall.....	76
Monthly precipitation (inches and hundredths) .....	76
Total precipitation by seasons .....	77
Greatest precipitation (inches and hundredths) in twenty-four hours .....	77
Prevailing wind direction .....	78
Highest velocity of wind (miles per hour) and direction .....	78
Average daily wind movement (miles per hour) .....	79
Average hourly wind velocity (miles per hour).....	79
Monthly seasonal and annual summaries .....	80
San Diego.....	81
Mean monthly and annual temperature .....	82
Maximum and minimum temperature.....	83
Mean monthly relative humidity (per cent) .....	85
Number of high winds in twenty-eight years .....	85
Summary of monthly means and extremes of temperature.....	85
Weather .....	85
Monthly, seasonal, and annual precipitation.....	86
Monthly extremes of precipitation .....	87
Greatest precipitation (in inches and hundredths) in twenty-four hours .....	87
Total number of days with precipitation since November 1, 1871 .....	87
Dates when precipitation equaled or exceeded 2.50 inches in any consecutive twenty-four hours.....	88
No snow reported to have fallen at San Diego since beginning of record in 1850 .....	88
Highest wind velocity, direction, and date for each month during the past twenty-seven years.....	88
Average hourly wind velocity (miles per hour) .....	88
Number of days with one hour or more of fogs and number of thunderstorms in eleven years.....	89
Average pressure (in inches and thousandths) for each hour of seventy-fifth meridian time .....	89
Average temperature each hour seventy-fifth meridian time.....	90
Sunshine for the years 1898, 1899, and 1900.....	90
Excessive precipitation.....	91
CLIMATOLOGY OF THE GREAT VALLEY.....	93
Red Bluff.....	93
Monthly and annual mean temperature .....	93
Summary of monthly means and extremes of temperature .....	94



## CLIMATOLOGY OF THE GREAT VALLEY—Continued.

Red Bluff—Continued.	Page.
Precipitation exceeding 2.50 inches in any consecutive twenty-four hours .....	94
Monthly and annual precipitation (inches and hundredths) .....	94
Greatest amount of precipitation (inches and hundredths) in twenty-four hours .....	95
Weather .....	95
Number of days with thunderstorms .....	95
Dates of first and last killing frosts, from 1882 to 1899, inclusive .....	96
Annual meteorological summary for the years 1899, 1900 .....	96
Sacramento .....	97
Mean monthly and annual temperatures .....	98
Maximum and minimum temperatures .....	99
Summaries of monthly means and extremes of temperatures .....	99
Weather .....	100
Dates of first and last light and killing frosts, with lowest temperature and snowfall, and dates of blossoming fruit trees from 1869 to 1901 .....	100
Monthly, annual, and seasonal precipitation (inches and hundredths) .....	101
Greatest precipitation (inches and hundredths) in twenty-four hours .....	103
Dates when precipitation equaled or exceeded 2.50 inches in any consecutive twenty-four hours .....	103
Monthly extremes of precipitation .....	103
Average hourly wind velocity (miles per hour) .....	104
Number of days with precipitation from July 1, 1877, to December 31, 1900 .....	104
Number of clear, partly cloudy, cloudy, rainy, and foggy days, and total number of thunderstorms and auroras from July 1, 1877, to December 31, 1900 .....	104
Number of high winds from July 1, 1877, to December 31, 1900 .....	105
Highest wind velocity, direction, and date from July 1, 1877, to April 30, 1901 .....	105
Greatest precipitation in the shortest periods of time from July, 1877, to April, 1901 .....	105
Fresno—	
Mean monthly and annual temperature .....	106
Summaries of monthly means and extremes of temperature .....	106
Dates of frost .....	107
Monthly, annual, and seasonal precipitation (inches and hundredths) .....	107
Greatest precipitation (inches and hundredths) in twenty-four hours .....	107
Monthly extremes of precipitation (inches and hundredths) .....	108
Weather .....	108
Foggy days and days with thunderstorms in twelve years .....	108
Highest wind velocity (miles per hour) and direction for twelve years .....	108
Average monthly relative humidity for twelve years .....	109
Sunshine for the years 1898, 1899, and 1900 .....	110
CLIMATE OF SANTA CLARA VALLEY .....	111
Mean monthly and annual temperature .....	111
Monthly and annual precipitation (inches and hundredths) .....	112
Menlo Park .....	112
Monthly and annual mean temperature .....	113
Monthly and annual precipitation .....	113
Maximum temperatures .....	114
Minimum temperatures .....	114
San Mateo .....	115
Monthly and annual mean temperature .....	115
Maximum temperatures .....	116
Monthly and annual precipitation (inches and hundredths) .....	116
Minimum temperatures .....	117
San Jose .....	117
Maximum temperatures .....	118
Minimum temperatures .....	118
Monthly and annual mean temperature .....	119
Monthly and annual precipitation .....	119
Mount Hamilton (Lick Observatory) .....	120
Maximum temperatures .....	120
Minimum temperatures .....	121
Monthly and annual mean temperature .....	121
Monthly and annual precipitation (inches and hundredths) .....	121
Mean relative humidity .....	122
Total monthly wind movement (miles) .....	122

## LOCAL CLIMATOLOGY\*

	Page
Aptos—	
Monthly and annual mean temperature .....	123
Monthly and annual precipitation (inches and hundredths) .....	124
Auburn .....	124
Maximum temperatures .....	125
Minimum temperatures .....	125
Monthly and annual mean temperatures .....	126
Monthly and annual precipitation (inches and hundredths) .....	126
Berkeley—	
Atmospheric pressure .....	127
Temperature .....	127
Precipitation .....	128
Relative humidity .....	128
Weather in general .....	128
Boca .....	128
Monthly and annual mean temperature .....	129
Monthly and annual precipitation (inches and hundredths) .....	129
Chico—	
Maximum temperature .....	130
Minimum temperature .....	131
Monthly and annual mean temperature .....	131
Monthly and annual precipitation (inches and hundredths) .....	132
Coronado .....	132
Average and extreme data for a period of thirteen years .....	133
Gilroy .....	133
Monthly and annual mean temperature .....	134
Monthly and annual precipitation (inches and hundredths) .....	134
Hollister .....	134
Monthly and annual mean temperature .....	135
Monthly and annual precipitation (inches and hundredths) .....	136
Independence—	
Monthly mean temperature .....	136
Summary of monthly means and extremes of temperature .....	137
Weather .....	137
Monthly and annual precipitation (inches and hundredths) .....	137
Greatest monthly precipitation (inches and hundredths) .....	138
Least monthly precipitation and data (inches and hundredths) .....	138
Number of times monthly precipitation has exceeded the normal for four years .....	138
Total number of days with precipitation since December 1, 1894 .....	138
Foggy days and thunderstorms .....	138
Number of high winds .....	138
Highest wind velocity, direction, and date for each month (miles per hour) .....	139
Average velocity of afternoon winds .....	139
Average hourly velocity .....	139
Mean monthly relative humidity (per cent) .....	139
Average snowfall since December 1, 1894 .....	140
Annual meteorological summary for the years 1899 and 1900 .....	141
Livermore—	
Monthly and annual mean temperature .....	142
Monthly and annual precipitation (inches and hundredths) .....	143
Mammoth Tank .....	143
Maximum temperature .....	144
Minimum temperature .....	144
Monthly and annual mean temperature .....	145
Monthly and annual precipitation (inches and hundredths) .....	145
Oakland .....	145
Monthly and annual mean temperature .....	146
Monthly and annual precipitation (inches and hundredths) .....	146
Redlands .....	147
Monthly and annual mean temperature .....	147
Monthly and annual precipitation (inches and hundredths) .....	147

## LOCAL CLIMATOLOGY—Continued.

	Page.
Riverside .....	147
Monthly and annual mean temperature .....	148
Monthly and annual precipitation (inches and hundredths) .....	148
Salinas .....	148
Mean, monthly, and annual temperature .....	149
Maximum temperature .....	150
Minimum temperature .....	150
Monthly and annual precipitation (inches and hundredths) .....	151
Salton—	
Monthly and annual mean temperature .....	151
Monthly and annual precipitation (inches and hundredths) .....	152
San Bernardino—	
Mean, monthly, and annual temperature .....	152
Highest and lowest temperature .....	152
Relative humidity .....	153
Monthly and annual precipitation (inches and hundredths) .....	153
Clear, fair, cloudy, rainy days; winds .....	154
Santa Cruz .....	154
Monthly and annual mean temperature .....	155
Monthly and annual precipitation (inches and hundredths) .....	155
Stockton .....	156
Mean temperature, 1871 to 1900 .....	156
Monthly and annual precipitation, 1850-1900 (inches and hundredths) .....	157
Truckee—	
Monthly and annual mean temperature .....	158
Monthly and annual precipitation (inches and hundredths) .....	159
Visalia—	
Temperature .....	159
Weather .....	160
Greatest precipitation in twenty-four hours for each month (inches and hundredths) .....	160
Mean monthly and annual temperature .....	160
Summary of means and extremes of temperature .....	161
Monthly, annual, and seasonal precipitation (inches and hundredths) .....	161
Extremes of precipitation .....	161
Total number of days with precipitation .....	162
Normal monthly and annual temperature .....	162
Minimum winter temperature of the high Sierra .....	164
Places for which precipitations are given:	
Anaheim, Orange County .....	167
Antioch, Contra Costa County .....	167
Aptos, Santa Cruz County .....	124
Auburn, Placer County .....	126
Bakersfield, Kern County .....	168
Berkeley, Alameda County .....	128, 168
Bishop, Inyo County .....	168
Boca, Nevada County .....	129
Byron, Contra Costa County .....	169
Caliente, Kern County .....	169
Calistoga, Napa County .....	170
Chico, Butte County .....	132
Colfax, Placer County .....	170
Colton, San Bernardino County .....	171
Corning, Tehama County .....	171
Coronado, San Diego County .....	113
Davisville, Yolo County .....	172
Delano, Kern County .....	172
Delta, Shasta County .....	173
Dunnigan, Yolo County .....	173
Dunsmuir, Siskiyou County .....	174
Eldorado, Eldorado County .....	174
Elmira, Solano County .....	174

Places for which precipitations are given—Continued		Page
Eureka, Humboldt County.....		26, 28
Fallbrook, San Diego County.....		175
Farmington, San Joaquin County.....		175
Fernando, Los Angeles County.....		176
Folsom, Sacramento County.....		176
Fort Ross, Sonoma County.....		177
Fresno, Fresno County.....	107, 108,	109
Fruto, Glenn County.....		177
Galt, Sacramento County.....		178
Georgetown, Eldorado County.....		178
Gilroy, Santa Clara County.....		134
Hollister, San Benito County.....		136
Independence, Inyo County.....	137,	138
Indio, Riverside County.....		179
Ione, Amador County.....		179
Iowa Hill, Placer County.....		180
Irvine, Orange County.....		180
Keeler, Inyo County.....		181
Kennedy Gold Mine, Amador County.....		181
King City, Monterey County.....		181
Knights Landing, Sutter County.....		182
Kono Tayse, Lake County.....		182
La Grange, Stanislaus County.....		183
La Porte, Plumas County.....		183
Livermore, Alameda County.....		143
Lodi, San Joaquin County.....		184
Los Angeles, Los Angeles County.....	76,	77
Los Banos, Merced County.....		184
Mammoth Tank.....		145
Manzana, Los Angeles County.....		185
Marysville, Yuba County.....		185
Mendota, Fresno County.....		185
Menlo Park, San Mateo County.....		113
Merced, Merced County.....		186
Modesto, Stanislaus County.....		186
Mokelumne Hill, Calaveras County.....		187
Mojave, Kern County.....		187
Monterey, Monterey County.....		188
Mount Hamilton (Lick Observatory), Santa Clara County.....		121
Napa, Napa County.....		189
Needles, San Bernardino County.....		189
Nevada City, Nevada County.....		190
Newcastle, Placer County.....		190
Newhall, Los Angeles County.....		191
Newman, Stanislaus County.....		191
Niles (near), Alameda County.....		192
North Bloomfield, Nevada County.....		192
North Hill Vineyard, Calaveras County.....		192
North Ontario, San Bernardino County.....		193
North San Juan, Nevada County.....		193
Oakdale, Stanislaus County.....		193
Oakland, Alameda County.....		146
Ogilby, San Diego County.....		193
Oleta, Amador County.....		194
Orland, Glenn County.....		194
Oroville, Butte County.....		194
Palermo, Butte County.....		195
Palm Springs, Riverside County.....		195
Pasadena, Los Angeles County.....		195
Paso Robles, San Luis Obispo County.....		195
Peachland, Sonoma County.....		196
Placerville, Eldorado County.....		196

## Places for which precipitations are given—Continued.

	Page.
Point Lobos .....	196
Point Reyes Light, Marin County .....	196
Pomona (near), Los Angeles County .....	197
Porterville, Tulare County .....	197
Poway, San Diego County .....	197
Quincy, Plumas County .....	197
Red Bluff, Tehama County .....	94, 95
Redding, Shasta County .....	198
Redlands, San Bernardino County .....	147
Repressa, Sacramento County .....	198
Rio Vista, Solano County .....	198
Riverside, Riverside County .....	148
Rosewood, Tehama County .....	199
Sacramento, Sacramento County .....	101, 103, 104, 105
Salinas, Monterey County .....	151
Salton, Riverside County .....	152
San Ardo, Monterey County .....	199
San Bernardino, San Bernardino County .....	153
San Francisco, San Francisco County .....	43, 44, 45, 46, 48
Sanger Junction, Fresno County .....	199
San Jose, Santa Clara County .....	119
San Leandro, Alameda County .....	199
San Luis Obispo, San Luis Obispo County .....	59, 60
San Mateo, San Mateo County .....	116
San Miguel, San Luis Obispo County .....	200
San Miguel Island, Santa Barbara County .....	200
Santa Ana, Orange County .....	200
Santa Barbara, Santa Barbara County .....	66
Santa Clara, Santa Clara County .....	201
Santa Cruz, Santa Cruz County .....	155
San Diego, San Diego County .....	86, 87, 88, 91
Santa Margarita, San Luis Obispo County .....	201
Santa Maria, Santa Barbara County .....	201
Santa Paula, Monterey County .....	202
Santa Rosa, Sonoma County .....	202
Selma, Fresno County .....	202
Shasta, Shasta County .....	202
Sierra Madre, Los Angeles County .....	203
Sisson, Siskiyou County .....	203
Soledad, Monterey County .....	203
Sonoma, Sonoma County .....	204
Stockton, San Joaquin County .....	157
Suisun, Solano County .....	204
Summerdale, Mariposa County .....	204
Summit, Placer County .....	205
Susanville, Lassen County .....	205
Tehachapi, Kern County .....	206
Tehama, Tehama County .....	206
Tracy, San Joaquin County .....	207
Truckee, Nevada County .....	159
Tulare (near), Tulare County .....	207
Ukiah, Mendocino County .....	207
Upper Lake, Lake County .....	208
Upper Mattole, Humboldt County .....	208
Vacaville, Solano County .....	208
Valley Springs, Calaveras County .....	209
Ventura, Ventura County .....	209
Vina, Tehama County .....	209
Visalia, Tulare County .....	160, 161, 162
Volcano Springs, San Diego County .....	209
Westley, Stanislaus County .....	210
Wheatland, Yuba County .....	210

Places for which precipitations are given—Continued	Page
Whittier, Los Angeles County .....	210
Williams, Colusa County .....	211
Willows, Glenn County .....	211
Winters, Yolo County .....	212
Wire Bridge, Placer County .....	212
Woodland, Yolo County .....	212
Yreka, Siskiyou County .....	213
Yuba City, Sutter County .....	213
SNOWFALL OF CALIFORNIA .....	215
Precipitation at high levels .....	224
FROST .....	227
Nature of .....	227
How it injures plants .....	228
Protection of orchards from .....	228
FOG .....	239
COMPARATIVE DATA .....	242
Mount Tamalpais .....	242
San Francisco .....	242
Sunshine at Mount Tamalpais .....	243
Notes on Fog at Mount Tamalpais .....	244
Wreck of the S S Rio de Janeiro .....	247
THUNDERSTORMS .....	251
EARTHQUAKES .....	259

